Operator's/Installation/Service Manual

Braun
Commercial
RA300 Transit Ramp
for
Low-Floor Transit Vehicles

WARNING
Manual
Read manual before operating, installing or servicing ramp. Failure to do so may result in serious bodily injury and/or property damage.

THE BRAUN CORPORATION®
"Providing Access to the World"®
International Corporate Hdqrs: P.O. Box 310 Winamac, IN 46996 USA
1-800-THE LIFT® (574) 946-6153 FAX: (574) 946-4670

33778
March 2007

Braun RA300 Transit Ramp

Congratulations

We at The Braun Corporation wish to express our fullest appreciation on your new purchase.

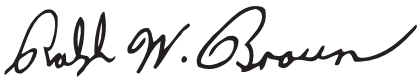
With you in mind, our skilled craftsmen have designed and assembled the finest ramp available.

This manual includes operating instructions, installation instructions, servicing instructions and instructions for troubleshooting, if needed.

Braun ramps are built for dependability and will provide years of service and mobility independence, as long as the ramp is installed and maintained as specified, and the ramp is operated by an instructed person.

Sincerely,

THE BRAUN CORPORATION



Ralph W. Braun
Chief Executive Officer

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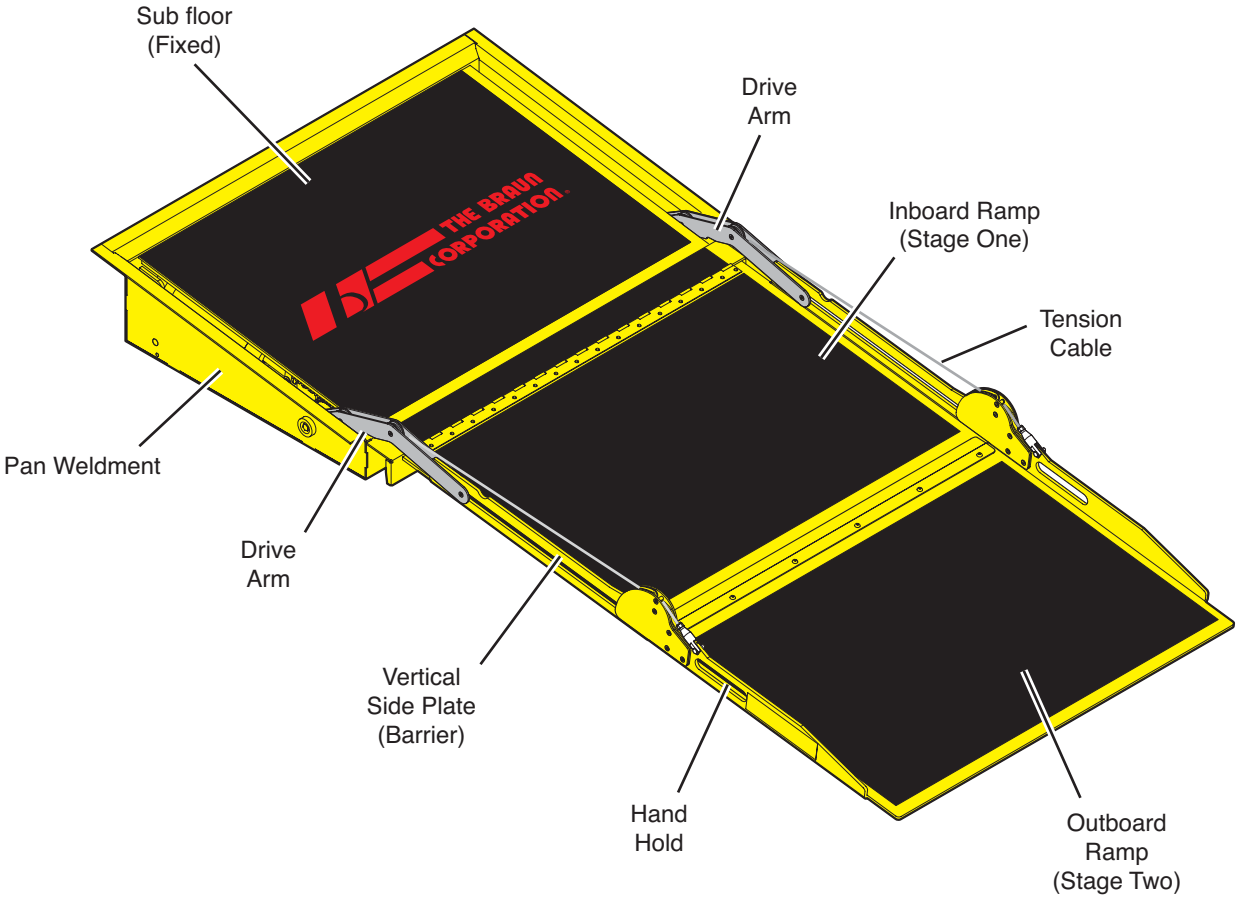
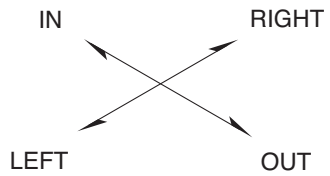
RAMP TERMINOLOGY

Ramp Terminology Illustration

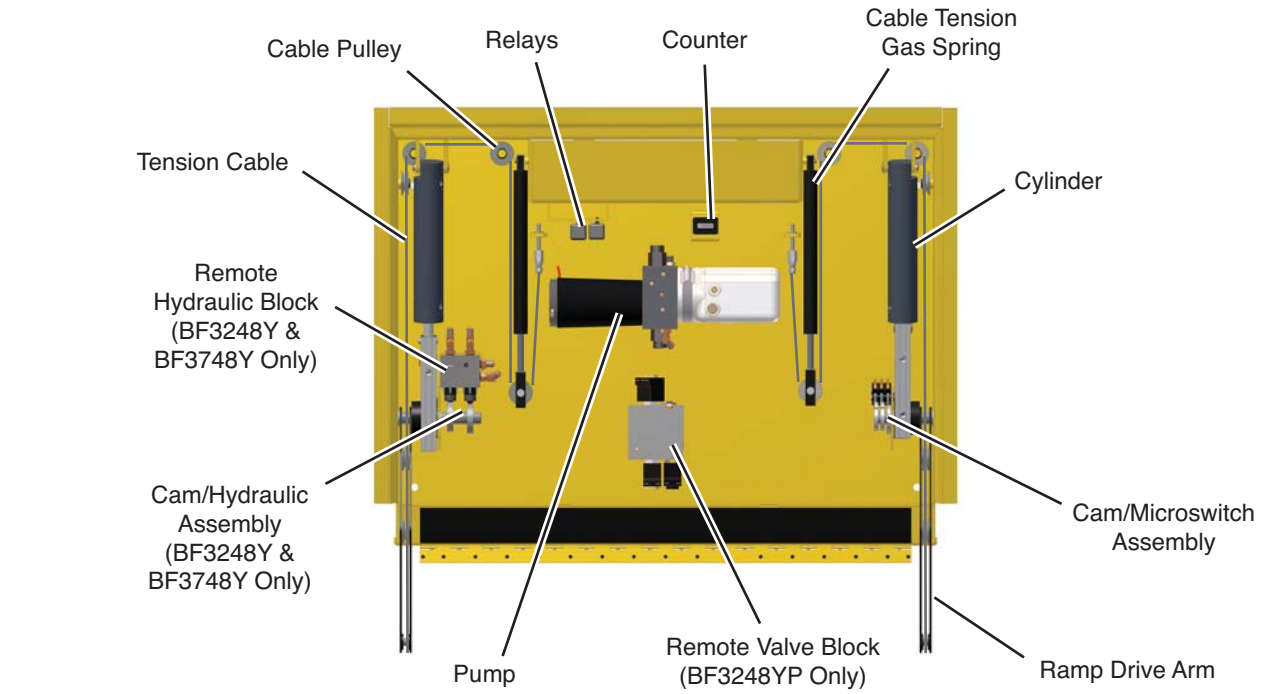
Refer to the illustration below and the illustrations on page 3 for identification of components and clarification of direction terminology. Details regarding lift model variations, terminology, direction and components are provided on pages 4 and 5.

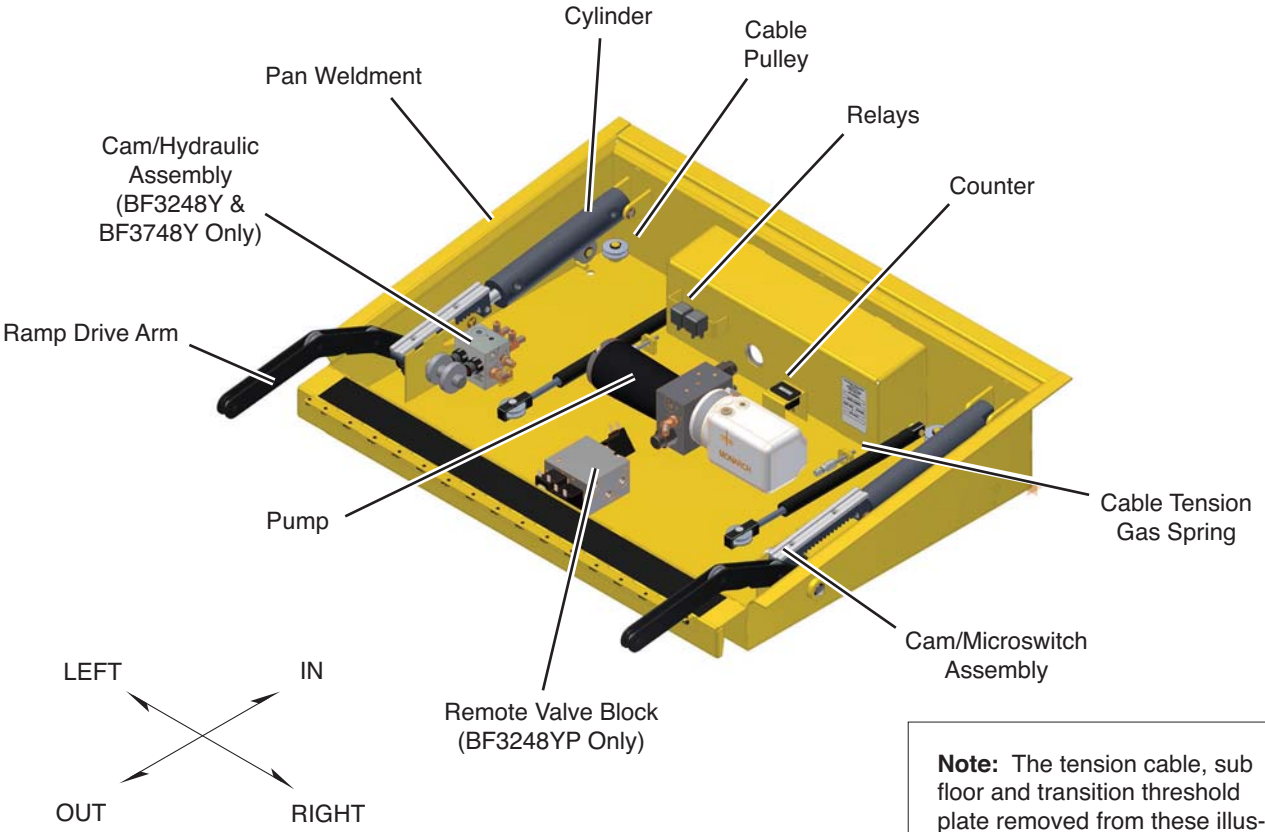




As viewed from outside the vehicle

Ramp Components Terminology Illustration





As viewed from outside the vehicle

Note: The tension cable, sub floor and transition threshold plate removed from these illustrations for clear view.

RAMP TERMINOLOGY

Introduction

Braun RA300 Series Transit Ramps (to be referred to as RA300 throughout this manual) are designed for use in low-floor transit vehicles. The RA300 provides vehicle access to people with disabilities (wheelchair passengers or standees using other type mobility aids). The commercial oriented ramp is ADA compliant (dependant upon installation height). See the Installation section for ADA specifications.

The self-contained “drop-in” unit requires no remote pump, external hydraulic lines or pre assembly. The hydraulic and electrical components are internal and easily accessible. A single electrical feed provides the power supply (12 volt or 24 volt), the ground, a ramp OUT signal (+), a ramp IN signal (+) and various indicator signals.

The RA300 features a 32” wide ramp in a 34” wide package. A “floor pocket” built into the chassis/floor system allows for simple installation (dimensional requirements specified in the Installation section).

The RA300 is specifically designed to be operated by an attendant. The ramp installer provides an appropriate control switch for the end user. Consquently, the operating instructions contained in this manual are generic due to the limitless variables.

The RA300 provides fully automatic operation of ramp functions. The electric/hydraulic system is controlled by two relays which activate the hydraulic pump in opposite directions for deploy and stow functions (powering a dual-acting hydraulic cylinder). No sensitive electronic controls or sensors are required for operation.

All RA300 ramp models feature gravity down "drift" during the deploy cycle. When deploying the ramp, the motor stops running when the ramp reaches an approximate 45° angle. The ramp continues to slowly lower the remaining distance by the force of gravity.

Ramp model numbers with suffix "Y" are hydraulic fold with gravity down "drift" feature when deploying and stowing. When stowing the ramp and it folds inward beyond the 15° shut off point, gravity lowers the ramp to the pan.

Ramp model numbers with suffix "YP" are hydraulic powered throughout the stow cycle (to full stow). The hydraulic system remains pressurized while the ramp is in the stowed position.

The pressure relief valves built into the pump prohibit the ramp from lifting (raising) with approximately 20 pounds or more on the ramp.

Instructions are provided for manual operation of the ramp in event of power or equipment failure. See **Manual Override** on the following page for further details.

Read and become familiar with all operation safety precautions, pre-operation notes and details, operating instructions and manual operating instructions before attempting operation.

Terminology: Become familiar with the terminology that will be used throughout this manual. Become familiar with the identification of RA300 components and their functions. Contact your sales representative or call The Braun Corporation at 1-800-THE LIFT® if any of this information is not fully understood.

Direction: The terms “left”, “right”, “in” and “out” will be used throughout this manual to indicate direction (as viewed from the outside of the vehicle looking directly at the ramp). Refer to the Terminology Illustrations for clarification of direction terms.

Ramp Components

Refer to the Terminology Illustrations on pages 2 and 3.

Pan Weldment (Housing): The pan is the stainless steel (casing) mounted in the vehicle floor system which contains the hydraulic pump and electrical components that power the ramp electric/hydraulic systems. The fixed sub-floor cover protects the components from above. The cover is easily removed for access to drive components. The sub-floor provides an antiskid surface for entry and exit when the ramp is deployed. The RA300 stows (folds) onto the sub floor providing an unobstructed antiskid surface for entry and exit when the ramp is not in use.

Ramp Assembly: The ramp assembly is made of an inboard ramp section (stage one) and an outboard ramp section (stage two). Each aluminum ramp section features vertical side plates and full antiskid surface.

Drive Arm Assembly: The cylinder driven three stage drive arm assembly deploys and stows the ramp assembly.

Ramp Actions and Functions

Deploy: Deploy is the action of the ramp assembly extending and unfolding to ground level when the DEPLOY (OUT) switch* is activated (*installer supplied).

Stow: Stow is the action of the ramp assembly raising and folding inward to stow position when the STOW (IN) switch* is activated (*installer supplied).

Stow Position: Stow position is achieved when the two stage ramp assembly is fully retracted and folded (resting fully on the pan weldment).

Manual Override: Manual operation is achieved without the use of any mechanical release or complicated procedures. Simply use the Hand Holds provided on the ramp assembly to manually deploy or stow the ramp. Minimal physical effort is required to route the hydraulic fluid through the system. Slow steady motion results in the least resistance and easy operation. The faster you attempt to manually operate the ramp, the greater the resistance. See Ramp Manual Operation on page 11 for further details.

RAMP OPERATION

Safety Symbols

SAFETY FIRST! Know That....

A All information contained in this manual and supplements (if included), is provided for your safety. Familiarity with proper operation instructions as well as proper maintenance procedures are necessary to ensure safe, trouble free operation. Safety precautions are provided to identify potentially hazardous situations and provide instruction on how to avoid them.

B

⚠WARNING

This symbol indicates important safety information regarding a potentially hazardous situation that could result in serious bodily injury and/or property damage.

C

⚠CAUTION

This symbol indicates important information regarding how to avoid a hazardous situation that could result in minor personal injury or property damage.

D **Note:** Additional information provided to help clarify or detail a specific subject.

These symbols will appear throughout this manual. **Recognize the seriousness of this information.**

Ramp Operation Safety Precautions

⚠WARNING

If the ramp operating instructions, manual operating instructions and/or ramp operation safety precautions are not fully understood, contact The Braun Corporation immediately. Failure to do so may result in serious bodily injury and/or property damage.

⚠WARNING Read manual and supplement(s) before operating ramp. Read and become familiar with all safety precautions, pre-operation notes and details, operating instructions and manual operating instructions before operating the ramp. **Note:** All transit agency personnel (drivers and ramp attendants) must read and become familiar with the contents of this manual and supplement(s) before operation.

⚠WARNING Load and unload on level surface only.

⚠WARNING Engage vehicle parking brake before operating ramp.

⚠WARNING Provide adequate clearance outside the vehicle to accommodate the ramp before opening lift door(s) or operating ramp.

⚠WARNING Inspect ramp before operation. Do not operate ramp if you suspect lift damage, wear or any abnormal condition.

⚠WARNING Keep operator and bystanders clear of area in which the ramp operates.

⚠WARNING Load and unload clear of vehicular traffic.

⚠WARNING Open ramp door(s) fully and secure before operating ramp.

⚠WARNING Do not overload or abuse. The rated capacity is 300 kilograms (660 pounds).

Ramp Operation Safety Precautions (continued)

⚠WARNING Do not activate control switch(es) when anyone is near the area in which ramp operates.

⚠WARNING It is the responsibility of the attendant to oversee and assist ramp passengers.

⚠WARNING The wheelchair passenger and/or attendant must ensure the ramp is fully deployed before exiting the vehicle.

⚠WARNING Attendants must never operate the vehicle, the ramp or attend to passengers if intoxicated.

⚠WARNING Intoxicated passengers should not be allowed to board the vehicle.

⚠WARNING Wheelchair passengers must position and secure (buckle, engage, fasten, etc.) the wheelchair-equipped occupant seat belt before loading onto the ramp.

⚠WARNING Be aware of the ramp slope (angle).

⚠WARNING Wheelchair passengers should not raise front wheelchair wheels (pull wheelie) when on the ramp.

⚠WARNING The wheelchair must be positioned in the center of the ramp when loading and unloading.

⚠WARNING Keep ramp owner's manual in ramp-mounted vehicle at all times.

⚠WARNING Maintenance and lubrication procedures must be performed as specified in this manual by authorized (certified) service personnel.

⚠WARNING Never modify (alter) a Braun Corporation ramp.

⚠WARNING Do not use accessory devices not authorized by The Braun Corporation.

⚠WARNING Do not remove any guards or covers.

⚠WARNING If the information contained in this manual is not fully understood, contact The Braun Corporation immediately.

⚠WARNING Failure to follow these safety precautions may result in serious bodily injury and/or property damage.

RAMP OPERATION

Pre-Operation Notes and Details

The RA300 Ramp provides vehicle access to people with disabilities (wheelchair passengers or standees using other type mobility aids). The commercial oriented RA300 Ramp is operated by the transit vehicle driver/attendant. Unless your transit agency has a published policy stating that driver/attendants do not aid ramp passengers, **safe entering and exiting of ramp passengers is the responsibility of the driver/attendant**.

As stated in the Ramp Operation Safety section, all information in this manual is provided for the safety of passengers, attendants and bystanders. **Recognize the seriousness of this information.**

Read and become familiar with all ramp operation safety precautions, pre-operation notes and details, operating instructions and manual operating instructions before attempting ramp operation procedures or assisting ramp passengers boarding and exiting the vehicle.

Ramp Access Doors and Interlocks

Attendants must become familiar with the vehicle ramp access door system and interlock(s), as well as the proper operation of the ramp.

Vehicle ramp access door configurations and operation procedures vary. Ensure the ramp door is fully open before activating the ramp (an interlock typically prevents ramp operation unless the door is fully open). Attendants and passengers must keep clear of the area in which the power door operates. Ensure the path is clear before closing the door. Be sure the door is fully closed before attempting to drive the vehicle (interlocks typically ensure this).

Interlocks are required by nearly all transit authorities. Vehicle interlocks typically prevent vehicle motion if the ramp is not stowed. In some cases, the ramp cannot be operated if interlock conditions are not met. Interlock requirements may include: the vehicle transmission must be engaged in Park, the parking brake must be engaged, the ramp access door must be fully open and/or others. Multiple interlocks may exist.

Instructions for operation of interlocks and door systems will not be addressed in this manual due to the variety of procedures required for operating them.

General instructions for safe operation of the ramp are provided. Ramp safety and ramp passenger safety information is included. **It is the responsibility of the attendant** to properly open and close the ramp access door(s), to activate interlock(s), to properly activate the ramp power functions as well as assist ramp passengers.

Do not operate the ramp if you suspect ramp damage, wear or any abnormal condition. Discontinue use immediately and contact The Braun Corporation at 1-800-THE LIFT®. One of our national Product Support representatives will direct you to an authorized service technician who will inspect the ramp.

Operation Procedure Review

The Braun Corporation recommends that transit agency supervisors and driver/attendants review the safety precautions and operation procedures appearing in this manual with the ramp sales representative (or vehicle converter) **before** attempting ramp operation.

Any questions or concerns can be answered at that time. Operate the ramp through all functions to ensure the proper use and operation is understood.

Transit agency supervisors should train and educate all driver/attendants on the proper use and operation of the vehicle, door system, interlock(s), ramp and ramp passenger safety.

The ramp owner's/service **manual must be stored in the ramp-equipped vehicle at all times**.

⚠WARNING

Read and become familiar with all ramp operation safety precautions, pre-operation notes and details, operating instructions and manual operating instructions prior to operating the ramp. If this information is not fully understood, contact The Braun Corporation immediately. Failure to do so may result in serious bodily injury and/or property damage.

Preventive Maintenance:

Maintenance is necessary to ensure safe and trouble free operation. General preventive maintenance consisting of **careful** inspections and cleaning the ramp system should be a part of your transit agency's daily service program. Simple inspections can detect potential operational problems.

Regular preventive maintenance will reduce potential operation downtime and increase the service life of the ramp, as well as possibly detecting potential hazards.

A generic **Daily Preventive Maintenance Schedule** is provided in this manual for your transit agency's use. The form can be tailored to your particular application.

Exposure to harsh weather, environmental conditions, or heavy usage may require more frequent maintenance and lubrication procedures.

Preventive maintenance visual inspections **do not** take the place of the procedures specified in the Maintenance and Lubrication Schedule provided in this manual. Refer to the Maintenance and Lubrication section in this manual for further details.

RAMP OPERATION

Ramp Power Operation

The power ramp is attendant operated and activated by the control switch provided by the vehicle converter (ramp installer). A momentary contact ramp control switch (center off) will typically be provided near the driver. The control switch may be part of a panel providing other features and controls (power on/off indicators, LED's, etc.).

Before operating the ramp, park the vehicle on a level area, away from vehicular traffic. Place the vehicle transmission in "Park" and engage the parking brake. Meet all other interlock conditions (as equipped). Activate the vehicle "kneel" system to lower the vehicle (if so equipped). Lowering the vehicle reduces the slope of the ramp.

Power Ramp Safety

⚠WARNING

Provide adequate clearance outside of vehicle to accommodate ramp. Failure to do so may result in serious bodily injury and/or property damage.

Be certain there is adequate clearance outside the vehicle before deploying the power ramp.

The ramp operator (attendant) and bystanders must keep clear of the area in which the ramp operates and clear of all moving parts. Attendants must ensure that passengers keep clear of the area in which the ramp operates. Do not attempt to grip or hold the ramp, ramp drive arm assemblies or the tension cables.

If you are an attendant operating the ramp, it is your responsibility to oversee and/or assist in performing safe passenger loading and unloading procedures. Observe your passengers at all times when they are entering and exiting the vehicle. Attendants must be aware of any special needs and/or procedures required for safe transport of wheelchair passengers.

Do not attempt to load or unload a passenger in a wheelchair or other apparatus that does not fit on the ramp. Do not exceed the 660 pound (300 kilograms) load capacity of the ramp. Passengers should enter and exit one at a time. The attendant should not board the ramp with the passenger except when assistance is required and the load capacity is not exceeded. Always return the ramp to the stowed position when not in use.

Gravity Down Drift

Deploy Gravity Down Drift (**All** RA300 models):

When deploying (unfolding) the ramp, the ramp pump motor stops running when the ramp reaches an approximate 45° angle (shut off point). The ramp continues to slowly lower the remaining distance by the force of gravity (non-powered).

Allow the ramp to unfold (deploy) fully before boarding the ramp. Forcing the ramp out or down during the deploy (unfold) function, or boarding onto the ramp before it is fully-deployed **may result in damage** to the ramp and/or drive assembly.

Stow Gravity Down Drift ("Y" ramp models **only**):

When stowing the ramp and it reaches an approximate 15° angle (shut off point), gravity lowers the ramp to the pan (floor).

Note: Pump motor shut off points are microswitch adjustable.

⚠CAUTION

Allow ramp to deploy fully before boarding. Failure to do so may result in damage.

Ramp Manual Operation

If you experience power or equipment failure, the ramp can be manually stowed and deployed. The RA300 ramp must be manually operated by an attendant.

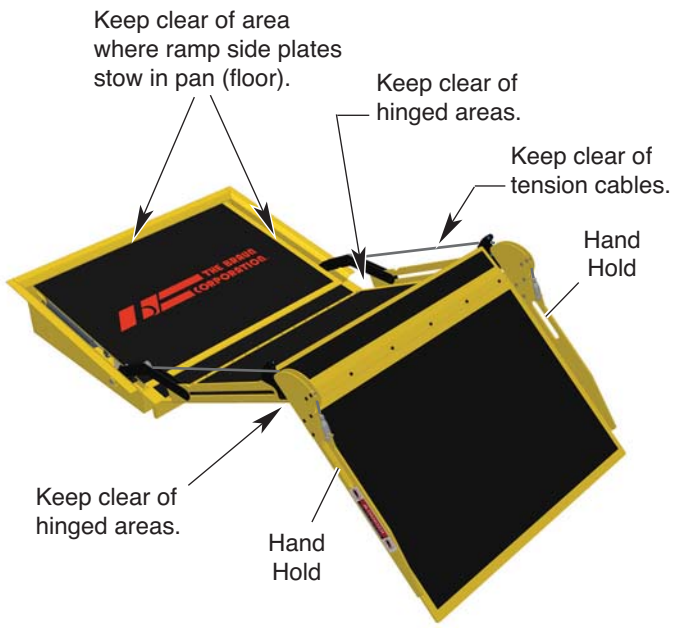
Two oval-shaped HAND HOLD slots are provided on the ramp (see Figure A). **Carefully** unfold and fold the ramp using the HAND HOLDs.

Keep clear of the area in which the hinged RA300 ramp sections fold and unfold. Keep clear of the area where the inboard ramp side plates stow in the pan (floor). Keep clear of tension cables and drive arms. Remember to use good body mechanics when folding and unfolding the ramp.

The safety precautions addressed in the Ramp Power Operation section apply to manual operation of the ramp also. **Read and become familiar with all ramp safety precautions**.

Note: Minimal physical effort is required to manually operate the ramp. Slow steady motion results in the least resistance and easy operation. The faster you attempt to manually operate the ramp, the greater the resistance.

Figure A


Keep clear of area where ramp side plates stow in pan (floor).
Keep clear of hinged areas.
Keep clear of tension cables.
Hand Hold
Keep clear of hinged areas.
Hand Hold

Use HAND HOLDs to **carefully** unfold and fold the ramp.

Ramp Passenger Safety

Unless your transit agency has a published policy stating that driver/attendants do not aid ramp (disabled) passengers, **it is the responsibility of the driver/attendant to ensure that ramp passengers enter and exit the vehicle on the ramp in the safest manner.**

ADA requirements state that transit drivers/attendants **must** assist with attaching and removing wheelchair and occupant restraint belts.

Ramp passengers (wheelchair passengers and standees), and attendants must use common sense and good judgment regarding ramp safety. Each wheelchair passenger (or standee) has a unique set of physical abilities combined with the physical characteristics of his or her wheelchair (or other mobility aid) that dictate the method in which he or she will enter and exit the vehicle.

Wheelchair attendants should be instructed on any special needs and/or procedures required for safe transport of wheelchair passengers. Follow all safety instructions regarding torso restraints, stability, balance, weight distribution and use of attendants as specified in the owner's manual supplied with the passenger's wheelchair (or other mobility aid). Wheelchair passengers must determine, establish and practice ramp boarding and exiting procedures under the direction of the their personal health care professional and wheelchair representative. Those procedures should be conveyed to the ramp attendant. Know your passengers abilities and needs for **optimum safety**.

Attendants must never operate the vehicle, the ramp or assist passengers if intoxicated. Intoxicated passengers should not be allowed to board or exit the vehicle.

Passengers should be positioned in the center of the ramp at all times. Attendants and ramp passengers must be able to clearly view the ramp whenever boarding and exiting the vehicle. The

Ramp Passenger Safety (Continued)

⚠WARNING

Position and fasten the wheelchair-equipped occupant seat belt before loading onto the wheelchair ramp. Failure to do so may result in serious bodily injury and/or property damage.

attendant and/or wheelchair passenger must ensure the ramp is fully deployed before exiting the vehicle. Observe your passengers at all times when they are entering and exiting the vehicle.

Wheelchair-Equipped Occupant Seat Belts: Wheelchair passengers should position and buckle their wheelchair-equipped seat belt (torso restraint), as specified by the manufacturer, **before** loading onto a wheelchair ramp.

Different types of disabilities require different types of wheelchairs and different types of wheelchair-equipped occupant restraint belt systems (torso restraint). It is the responsibility of the wheelchair passenger to have his or her wheelchair equipped with an occupant restraint (seat belt) under the direction of their health care professional.

Stabilizing Wheelchairs: Powered and manual wheelchairs are designed to remain upright and stable during normal operation. All activities which involve movement in a wheelchair have an effect on the combined center of gravity of the occupant and wheelchair. Be aware of the ramp slope (angle). The slope of the ramp has a direct effect on the center of gravity. The wheelchair passenger's center of gravity and their ability to maintain stability and balance must be kept in mind by the wheelchair passenger and the attendant.

The aid of an attendant stabilizing the wheelchair is recommended for **optimum safety**. Wheelchair passengers who are unable to maintain stability and balance should not board a ramp without assistance. Counterbalance devices (anti-tippers) may be available from the wheelchair representative to enhance stability and balance.

Wheelchairs should be operated at a slow and constant speed when on the ramp. Wheelchairs should not accelerate suddenly when on the ramp. Wheelchair passengers should not raise the front wheelchair wheels (pull wheelie) when on the ramp.

Wheelchair passengers who intend to enter and exit the vehicle without the assistance of an attendant must determine the safest and most practical method and orientation of entering and exiting based on the physical characteristics of their personal wheelchair and his or her physical capabilities to maintain stability while the wheelchair is in motion on the ramp.

Wheelchair Attendants: When assisting a wheelchair occupant, remember to use good body mechanics. When the wheelchair is on the ramp, the attendant must grasp the push handles (or other) securely. Detachable wheelchair parts such as arms or leg rests must never be used for hand holds or lifting supports. Doing so could result in the parts being inadvertently detached from the wheelchair **resulting in possible injury to the wheelchair occupant and/or the attendant**.

Safety Symbols

SAFETY FIRST! Know That....

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B

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This symbol indicates important safety information regarding a potentially hazardous situation that could result in serious bodily injury and/or property damage.

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D **Note:** Additional information provided to help clarify or detail a specific subject.

These symbols will appear throughout this manual. **Recognize the seriousness of this information.**

Installation / Service Safety Precautions

⚠WARNING

If installation, maintenance or repair procedures cannot be completed exactly as provided in this manual or if the instructions are not fully understood, contact The Braun Corporation immediately. Failure to do so may result in serious bodily injury and/or property damage.

⚠WARNING Read this manual and supplement(s) before performing installation, operation or service procedures.

⚠CAUTION Installation specifications and dimensions must be met.

⚠WARNING Remove any obstructions within the ramp mounting/operating area prior to beginning installation procedures.

⚠WARNING Do not operate ramp prior to positive securement of the pan.

⚠WARNING Check for obstructions such as gas lines, wires, exhaust, etc. before drilling or cutting during installation procedures.

⚠WARNING Route all cables clear of exhaust system, other hot areas, moving parts, wet areas, etc.

⚠WARNING Risk of electrical shock or fire! Use extra care when making electrical connections. Connect and secure as outlined in Installation Instructions and Wiring Diagrams.

⚠WARNING Meet all ramp positioning and clearance specifications as detailed in the Positioning and Clearance Checklist before operating ramp.

⚠WARNING Maintenance and repairs must be performed only by authorized service personnel.

⚠WARNING Perform maintenance and lubrication procedures exactly as outlined in the Maintenance and Lubrication Schedule contained in this manual.

Installation/Service Safety Precautions (Continued)

⚠WARNING Disconnect the power cable at the battery prior to servicing.

⚠WARNING Keep hands, arms and all other body parts clear of moving parts.

⚠WARNING Never modify (alter) a Braun Corporation ramp.

⚠WARNING Replacement parts must be Braun authorized replacements.

⚠WARNING Never install screws or fasteners (other than factory equipped).

⚠WARNING Whenever replacing a hydraulic cylinder or seals, deploy ramp fully.

⚠WARNING Failure to follow these safety precautions may result in serious bodily injury and/or property damage.

Installation Requirements

Braun RA300 Ramps must be installed and serviced by a Braun authorized service representative who has attended and been certified by The Braun Corporation Sales and Service School for Braun Mobility Products.

Read and become familiar with the operating instructions and the installation instructions contained in this manual before beginning installation, operation or service procedures.

⚠WARNING

Read this manual, before performing installation, operation or service procedures. Failure to do so may result in serious bodily injury and/or property damage.

Chassis Requirements

The Braun RA300 Ramp is designed for use in low-floor transit vehicles. A “floor pocket” (mounting hole) built into the chassis/ floor system allows for simple installation (accepts “drop-in” unit). The **Floor Pocket Clear Opening Dimensions** are specified on pages 15 and 16. See Figures B, C, D and E.

The ramp installer must provide an appropriate framework in the applicable location in the vehicle (aligned center with passenger door opening). Ramp assembly mounting hardware and/or brackets are directly dependant upon the vehicle chassis and “floor pocket” configuration (not supplied).

Slope: The portion of the floor where the ramp mounts must slope at an approximate 8° angle (see Figure C).

Outboard Support Tube: An outboard support tube must be positioned under the outboard edge of the opening (minimum 1-1/2” x 2” steel tube). See Figures C and D. The recommended height of the support tube is 12” above ground level. **Kneeling Vehicles:** This dimension measured with suspension lowered.

ADA: Installations with the support tube positioned higher than 12” above ground level may not comply with ADA ramp slope requirements.

Some OEM chassis meet these specifications. The RA300 ramp was designed to conform to these specifications.

The ramp pan horizontal border (lip) sets on the floor pocket perimeter, (framework, sub floor, etc.). The finished flooring can be cut to conform to the border of the pan for a flush transition surface from ramp-to-floor.

Door Opening: Open the door(s) **fully** and check the clear door opening width dimension. **Specified minimum clear door opening width must be provided** (34" for 32" ramps and 39-1/2" for 37" ramps). See Figure F.

Door(s) **must open outward**. When closed, the door(s) should align with and conform to the outboard edge of the ramp pan (rubber seal on bottom of door).

Minimum Clear Door Opening Dimensions are defined as finished door opening, including any intrusive door jambs, headers, sills or hinges.

Obstructions: Any intrusive obstructions within the door opening or the ramp mounting/operating area (such as seats, molding, lights, brackets, etc.) **must be removed**. Trim or molding that creates an uneven mounting surface should be removed. The molding can be modified to fit around the ramp pan horizontal border (lip).

There **must be a minimum 1/8" clearance between the deployed ramp assembly and the vehicle floor or any obstruction** on the floor (such as a rubber sill or threshold).

"Floor Pocket" Clear Opening Dimensions

Outboard Support Tube: Recommended Height: 12" above ground level. **Kneeling Vehicles** (measured with suspension lowered).

ADA: Installations with support tube positioned higher than 12" above ground level **may not comply with ADA** ramp slope requirements.

The portion of the floor where the ramp mounts must slope at an approximate 8° angle.

Figure B

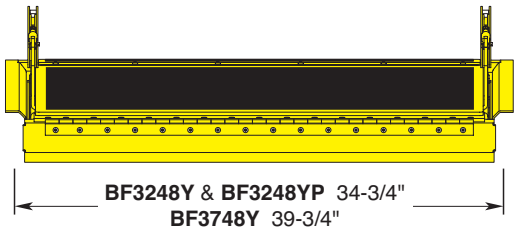
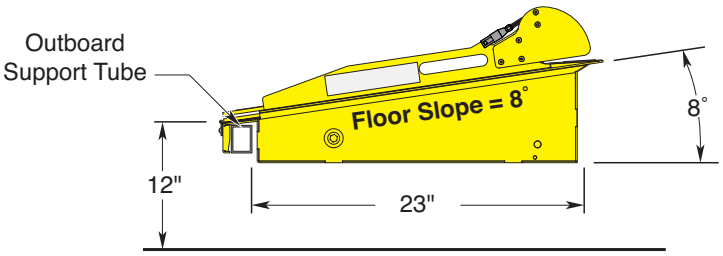
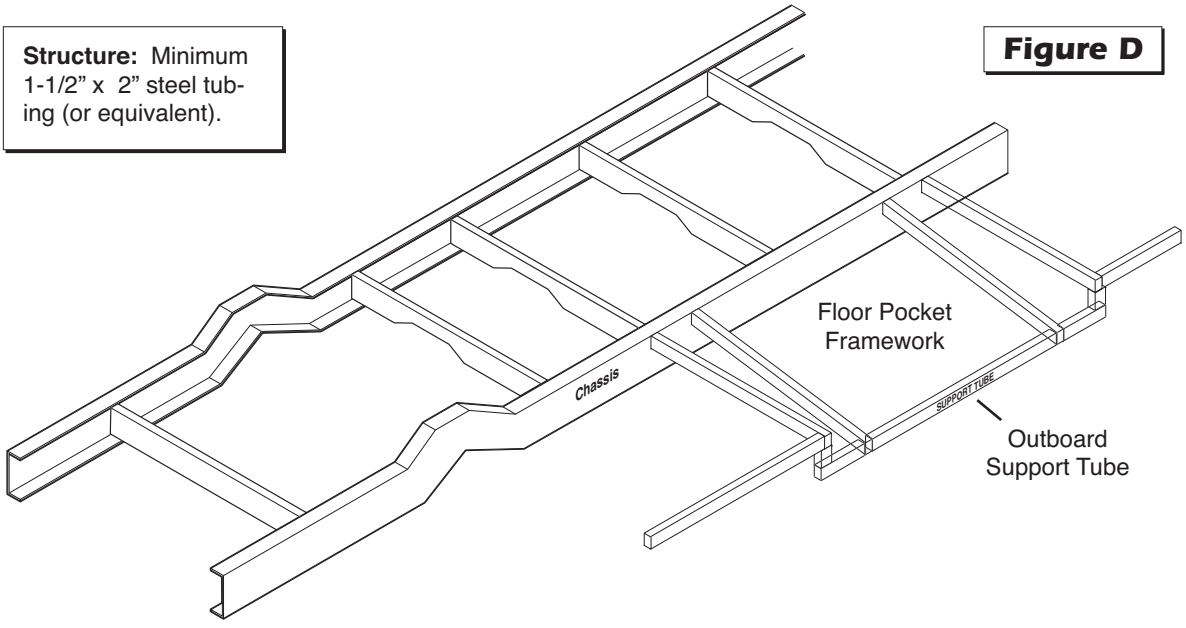


Figure C



Structure: Minimum 1-1/2" x 2" steel tubing (or equivalent).

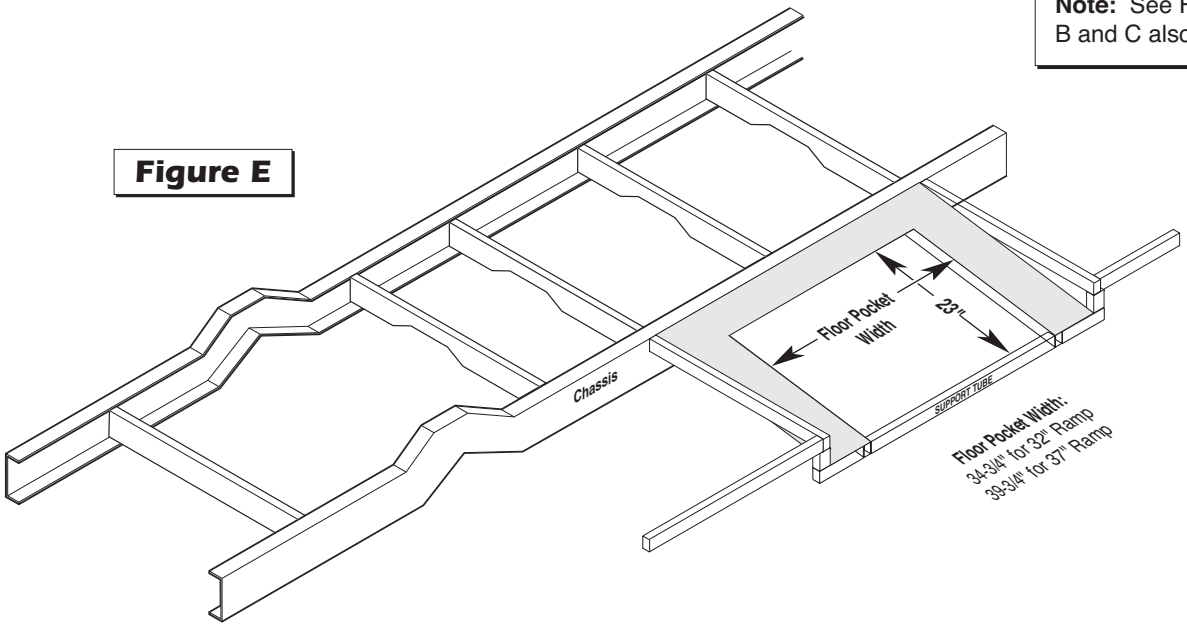
Figure D



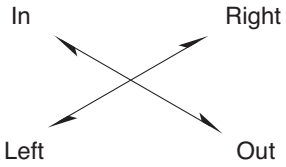
"Floor Pocket" Clear Opening Dimensions

Note: See Figure B and C also.

Figure E

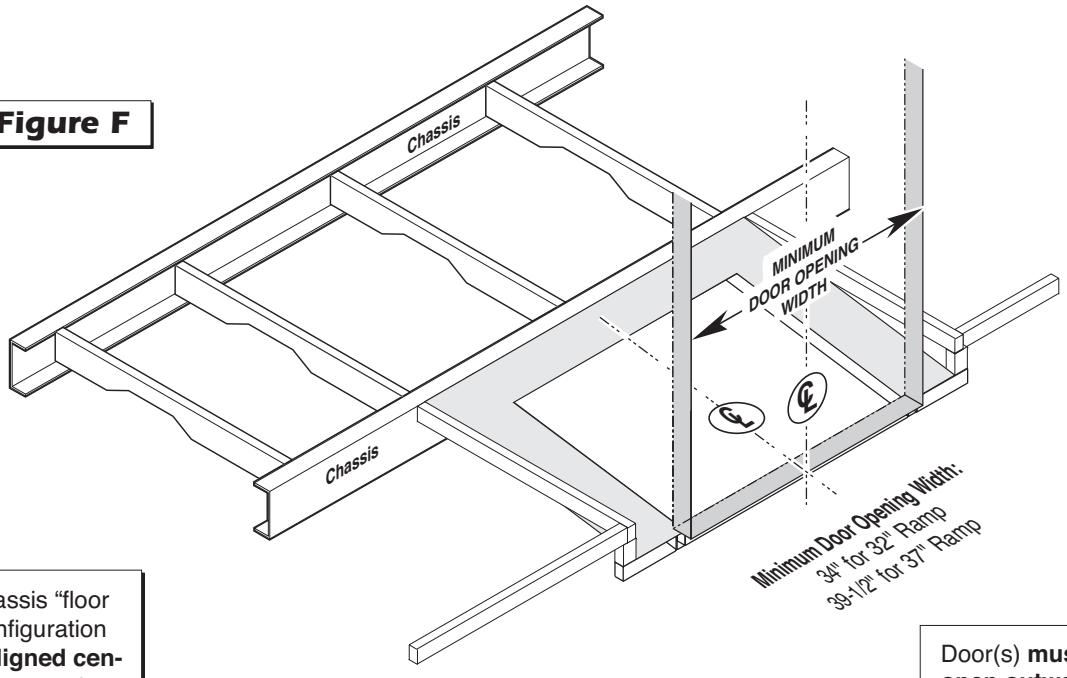


Clear Door Opening Width Dimension



As viewed from outside the vehicle

Figure F

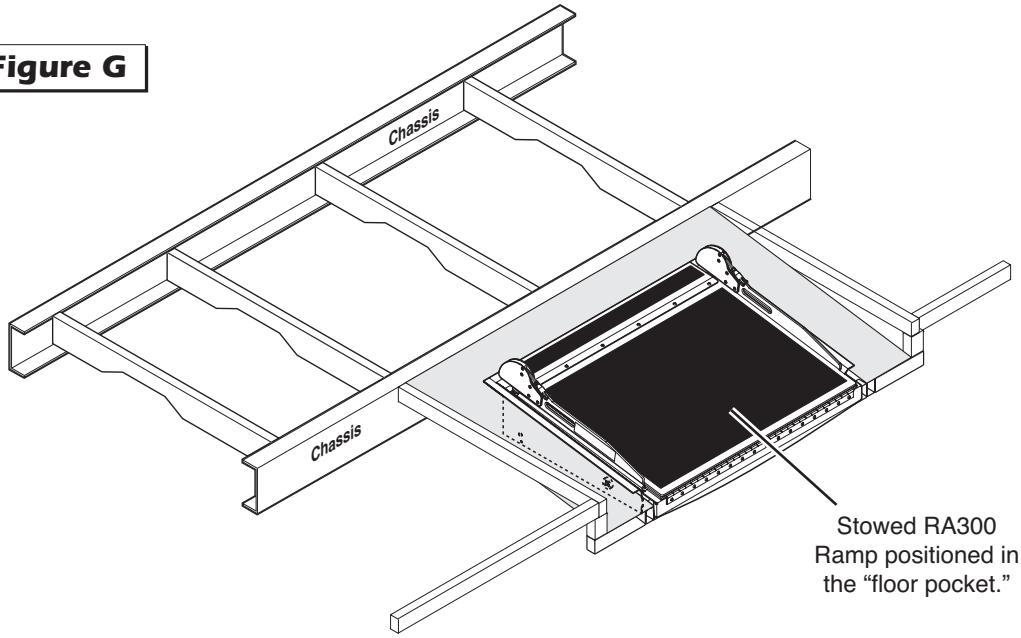


Vehicle chassis "floor pocket" configuration **must be aligned center** with door opening.

Door(s) **must open outward**.

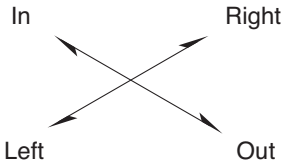
Installed Ramp - Stowed

Figure G



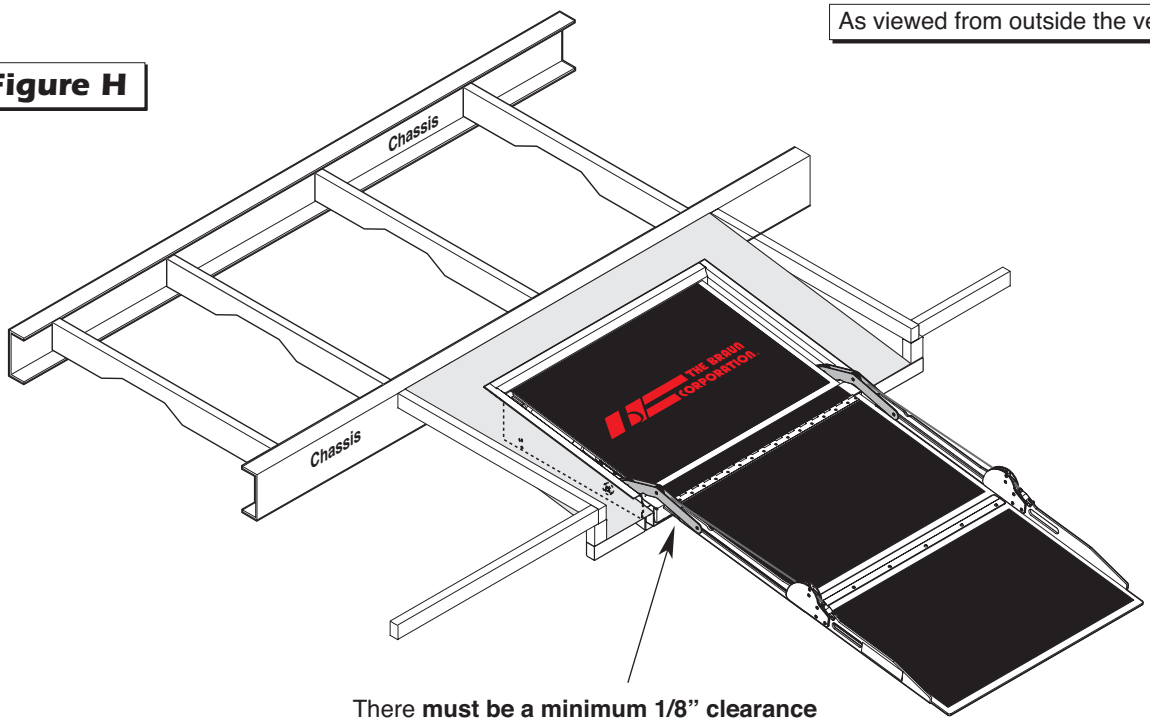
Stowed RA300 Ramp positioned in the “floor pocket.”

Installed Ramp - Deployed



As viewed from outside the vehicle

Figure H



There **must be a minimum 1/8” clearance between the deployed ramp assembly and the vehicle floor or any obstruction** on the floor (such as a rubber sill or threshold).

Electrical Connections

An 8-pin Deutsch connector is mounted at the back of the RA300 ramp. A mating connector (male plug) is supplied with the ramp. The power supply (12 volt or 24 volt), the ground, a ramp OUT signal (+) and a ramp IN signal (+) must be terminated in the supplied Deutsch connector.

The ramp installer provides an appropriate control switch for the end user. A momentary contact ramp control switch (center off) will typically be mounted near the driver. The control switch may be part of a panel providing other features and controls (power on/off indicators, LED's, etc.).

Make electrical connections as shown in Figure K page 19. Strip wires, crimp and install contacts as specified in instructions supplied with 8-pin Deutsch connector.

⚠WARNING

Route cables clear of exhaust system, other hot areas and moving parts. Failure to do so may result in serious bodily injury and/or property damage.

The Positive (+) "battery" lead wire **must be protected by an in-line 30 ampere fuse or circuit breaker** (installer provided).

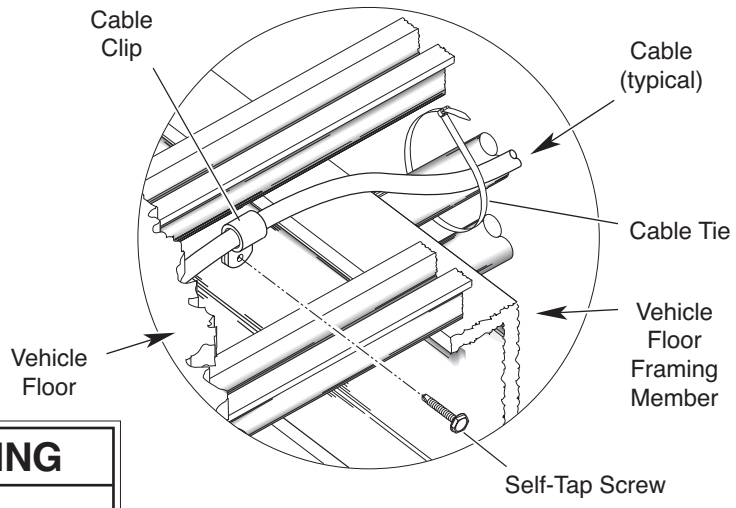
Do not connect the power "battery" lead wire to the battery until all other connections are made.

Connect the 8-pin Deutsch male plug to the mating Deutsch connector mounted at the back of the pan.

Carefully connect the power "battery" lead wire to the Positive (+) battery post.

Figure J

Secure all cables using cable ties and/or cable clips (mount clips with self-tap screws).



⚠WARNING

Risk of electrical shock! Use extra care when making electrical connections.

⚠WARNING

Risk of electrical fire! Use extra care when making electrical connections.

Chassis Ground Corrosion: When mounting chassis ground cables, remove undercoating, dirt, rust, etc. from the framing member around the mounting holes. Apply a protective coating to mounting holes to prevent corrosion. Apply grease to ground cable terminals and mounting hardware. **Failure to do so will void warranty of certain electrical components**.

Electrical Connections

An 8-pin Deutsch connector (male plug) is supplied with the ramp.

The ramp installer provides an appropriate momentary contact control switch.

Terminate the power supply, ground, ramp OUT signal and ramp IN signal as specified in legend.

The Positive (+) "battery" lead wire **must be protected by an in-line 30 ampere fuse or circuit breaker** (installer provided).

⚠WARNING

Positive (+) battery lead wire must be protected by installer-provided 30 ampere fuse or circuit breaker. Failure to do so may result in serious bodily injury and/or property damage.

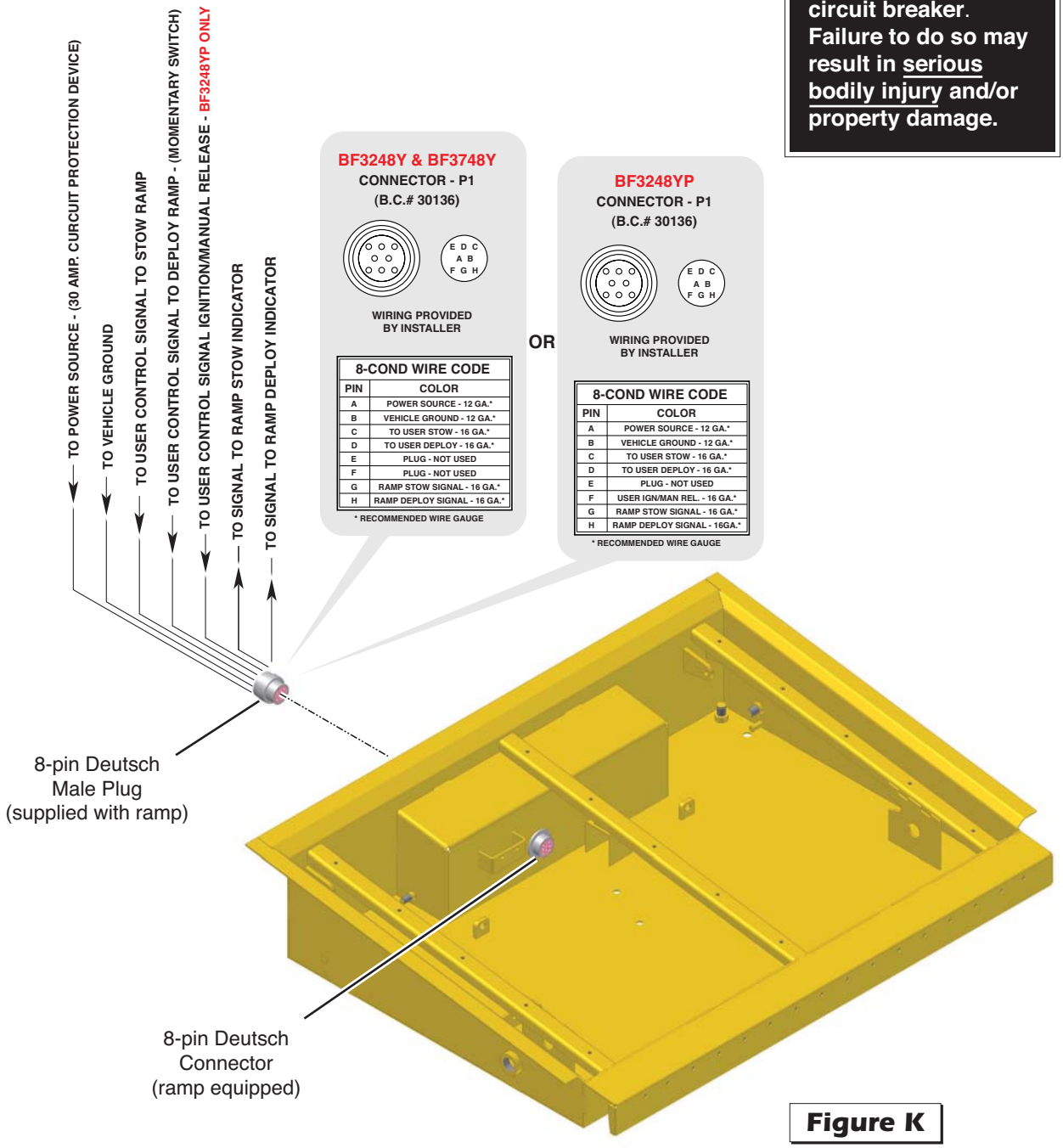
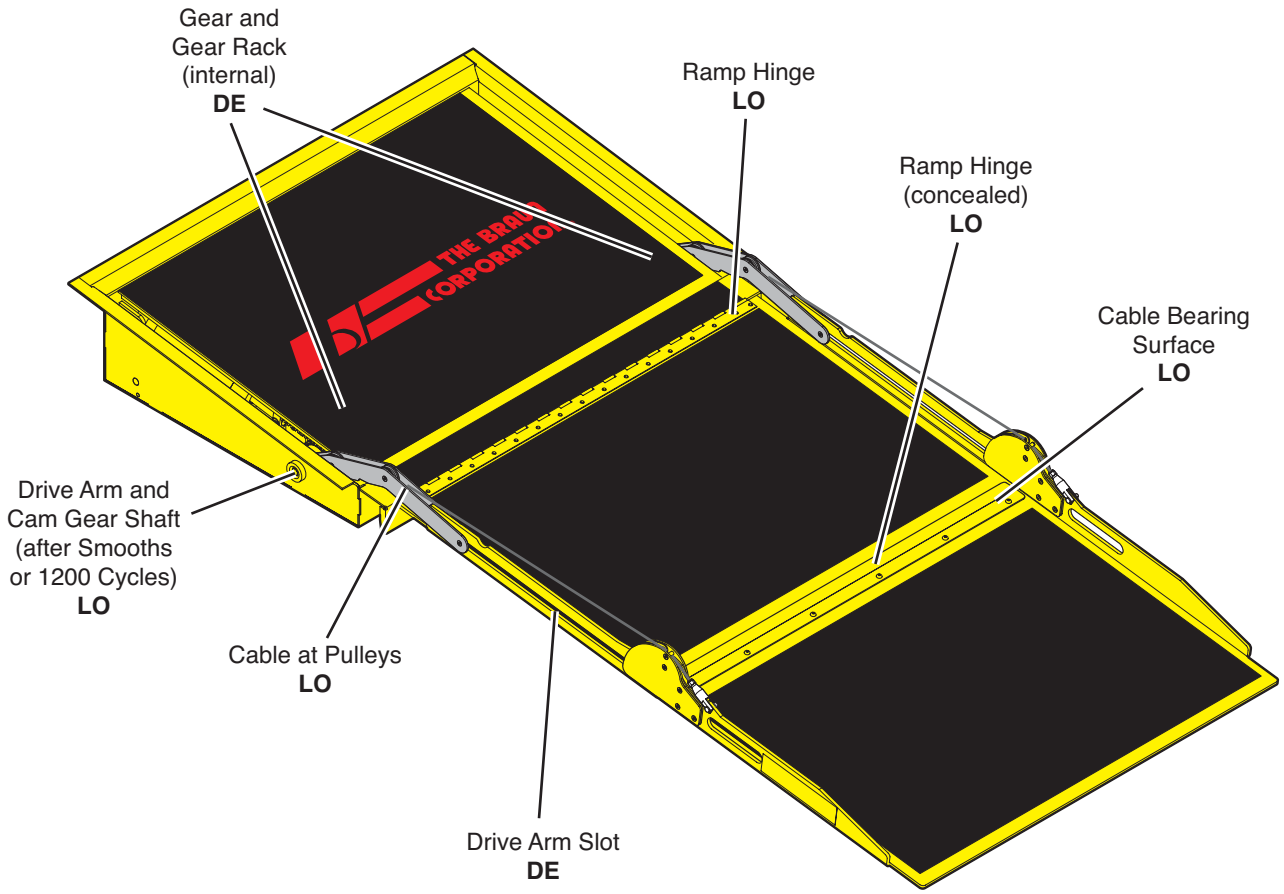

TO POWER SOURCE - (30 AMP. CURCUIT PROTECTION DEVICE)
TO VEHICLE GROUND
TO USER CONTROL SIGNAL TO STOW RAMP
TO USER CONTROL SIGNAL TO DEPLOY RAMP - (MOMENTARY SWITCH)
TO USER CONTROL SIGNAL IGNITION/MANUAL RELEASE - BF3248YP ONLY
TO SIGNAL TO RAMP STOW INDICATOR
TO SIGNAL TO RAMP DEPLOY INDICATOR
BF3248Y & BF3748Y
CONNECTOR - P1
(B.C.# 30136)
E D C A B F G H
WIRING PROVIDED BY INSTALLER
8-COND WIRE CODE
PIN | COLOR
A | POWER SOURCE - 12 GA.*
B | VEHICLE GROUND - 12 GA.*
C | TO USER STOW - 16 GA.*
D | TO USER DEPLOY - 16 GA.*
E | PLUG - NOT USED
F | PLUG - NOT USED
G | RAMP STOW SIGNAL - 16 GA.*
H | RAMP DEPLOY SIGNAL - 16 GA.*
* RECOMMENDED WIRE GAUGE
OR
BF3248YP
CONNECTOR - P1
(B.C.# 30136)
E D C A B F G H
WIRING PROVIDED BY INSTALLER
8-COND WIRE CODE
PIN | COLOR
A | POWER SOURCE - 12 GA.*
B | VEHICLE GROUND - 12 GA.*
C | TO USER STOW - 16 GA.*
D | TO USER DEPLOY - 16 GA.*
E | PLUG - NOT USED
F | USER IGN/MAN REL. - 16 GA.*
G | RAMP STOW SIGNAL - 16 GA.*
H | RAMP DEPLOY SIGNAL - 16GA.*
* RECOMMENDED WIRE GAUGE
8-pin Deutsch Male Plug (supplied with ramp)
8-pin Deutsch Connector (ramp equipped)

Figure K

Electrical Connections Illustration

Lubrication Diagram

See the Maintenance/Lubrication Schedule for recommended applications per number of cycles or elapsed time.



Lubricant	Type	Specified (recommended) Lubricant	Available Amount	Braun Part No.
LO - Light Oil	Light Penetrating Oil (30 weight or equivalent)	LPS2, General Purpose Penetrating Oil	11 oz. Aerosol Can	15807
DE - Door-Ease	Stainless Stick Style (tube)	Door-Ease Stick (tube)	1.68 oz.	15806
LG - Light Grease	Light Grease (Multipurpose)	Lubricate	14 oz. Can	15805

Maintenance and Lubrication Introduction

Proper maintenance is necessary to ensure safe, trouble-free operation. Inspecting the ramp for any wear, damage or other abnormal conditions should be a part of all transit agencies daily service program (preventive maintenance). Simple inspections can detect potential problems.

A generic **Daily Preventive Maintenance Schedule** is provided in this manual for transit agency use. The form can be tailored to your particular application. Preventive maintenance visual inspections **do not** take the place of the procedures specified in this schedule.

The maintenance and lubrication procedures specified in this schedule **must** be performed by a Braun authorized service representative at the scheduled intervals according to the number of cycles or elapsed time, whichever comes first.

RA300 Ramps are equipped with hardened pins and self-lubricating bearings to decrease wear, provide smooth operation and extend the service life of the ramp.

Clean the components and the surrounding area **before applying lubricants**. LPS2 General Purpose Penetrating Oil is recommended where Light Oil is called out. Use of improper lubricants can attract dirt or other contaminants which could result in wear or damage to the components. Ramp components exposed to contaminants when lowered to the ground may require extra attention. Specified lubricants are available from The Braun Corporation (part numbers provided on page 20).

Recommended Intervals: These intervals are a general guideline for scheduling maintenance procedures and will vary according to ramp use and conditions. Transit agencies operating vehicles equipped with ramps that are not monitored by cycles may choose to have the ramp system maintained on the same schedule as the vehicle (routine maintenance). Doing so ensures the ramp is being maintained regularly.

⚠WARNING

Maintenance and lubrication procedures must be performed as specified by an authorized service technician.
Failure to do so may result in serious bodily injury and/or property damage.

When servicing the ramp at the consecutive recommended intervals, inspection and lubrication procedures specified in the previous sections should be performed (repeated). **All** listed inspection, lubrication and maintenance procedures should be repeated at "8 Weeks or 200 Cycles" intervals following the scheduled "1 Year or 1250 Cycles" maintenance.

Lifts exposed to severe conditions (weather, environment, contamination, heavy usage, etc.) may require inspection and maintenance procedures to be performed more often than specified.

Discontinue ramp use immediately if maintenance and lubrication procedures are not properly performed, or if there is any sign of wear, damage or improper operation. Contact your sales representative or call The Braun Corporation at 1-800-THE LIFT®. One of our national Product Support representatives will direct you to an authorized service technician who will inspect your ramp.

Maintenance and Lubrication Schedule

8 Weeks or 200 Cycles	Inboard ramp hinge	Clean and lubricate. Apply Light Oil - See Lubrication Diagram
	Outboard ramp hinge	Clean and lubricate. Apply Light Oil - See Lubrication Diagram
	Drive arm pivot pins (screws, nuts and bearings)	Apply Light Oil - See Lubrication Diagram
	Drive arm and cam gear pivot shaft	Apply Light Oil - See Lubrication Diagram

continued

continued	Cable at pulley and hinge areas	Clean and lubricate. Apply Light Oil - See Lubrication Diagram
	Drive arm slot	Apply Door-Ease. See Lubrication Diagram
8 Weeks or 200 Cycles	Inspect drive arm pivot points (mounting screws, nuts and bearings) for positive securement, wear or damage	Tighten, replace or correct as needed.
	Inspect drive arm slots for excessive wear or damage	Correct as needed
	Clean ramp and ramp mounting area (ensure no debris in area to obstruct stowing/stacking)	Clean and remove debris or obstructions
	Cycle ramp and observe drift speed during deploy and stow functions	If drifts too fast, adjust applicable Drift Microswitch Cam so drift begins at reduced height.
	Inspect ramp for wear, damage or any abnormal condition.	Correct as needed

	Perform all procedures listed in previous section also	
	Remove sub floor (pan cover) and clean dirt and other foreign debris	Blow out with air compressor
	Remove sub floor (pan cover) and lubricate drive arm gear and cylinder gear rack	Clean and lubricate. Apply Door-Ease
	Remove sub floor (pan cover) and inspect:	
1 Year or 1250 Cycles	• Pump mounting bolts for securement (loose or missing)	Resecure, adjust microswitches, replace damaged parts or otherwise correct as needed.
	• Drive arm and gear rack weldment teeth for foreign objects, wear or damage (bent, deformed, misaligned), positive securement and proper operation	
	• Gear rack weldment pin securement E-clip (loose or missing)	
	• Hydraulic cylinder, hoses, fittings and connections for wear, damage or leaks	
	• Harness cables, wires, terminals and connections for securement or damage	
	• Relays for securement or damage	
	• Microswitches and cams for securement and adjustment	
	• Microswitch wires and terminals for securement or damage	

continued **1 Year or 1250 Cycles**	Hydraulic Fluid (Pump) - Check level. **Note:** Fluid should be changed if there is visible contamination. Inspect the hydraulic system (cylinder, hoses, fittings, seals, etc.) for leaks if fluid level is low.	Use Braun 32840-QT (Exxon® Univis HVI 26) hydraulic fluid (**do not mix** with Dextron III or other hydraulic fluids). Check fluid level with **ramp deployed fully**. Fill to within 1/2" of the bottom of the 1-1/2" fill tube (neck).
	Inspect vehicle-to-ramp wiring harness	Resecure, repair or replace or otherwise correct as needed
	Mounting	Check to see that the ramp is securely anchored to the vehicle and there are no loose bolts, broken welds, or stress fractures.
	Decals and Antiskid	Replace decals if worn, missing or illegible. Replace antiskid if worn or missing.

Consecutive 8 Week or 200 Cycle Intervals	**Repeat all** previously listed inspection, lubrication and maintenance procedures at 8 week or 200 cycle intervals (or per vehicle maintenance schedule).

Electrical

⚠WARNING

Improper microswitch adjustment may result in serious bodily injury and/or property damage.

Microswitches: Three microswitches (limit switches) are incorporated in the RA300 Ramp electrical system. "Y" ramp models microswitches are: Drift-In, Drift-Out and Counter. The "YP" ramp model also has three microswitches: Drift-In, Drift-Out and Power Down Activation. Details and photos of the microswitches are provided below. Adjust microswitch(es) as detailed (if necessary only).

Microswitch Sequence

Stowed Position: When the ramp is in the stowed position, the Drift-Out and Counter microswitches are deactivated (common and normally closed terminals have continuity). In contrast, the Drift-In microswitch is activated.

Deploy Sequence: When the ramp is in the stowed position, the Drift-Out microswitch is deactivated. Current is allowed to pass from the vehicle Deploy Relay, which directs current to the Bidirectional Pump motor in direction A (hydraulically drives cylinders to deploy ramp).

When the ramp's platform reaches the Drift-In limit (approx. 45° above ground level), the microswitch is activated (common and normally open terminals have continuity), and the current to the Deploy Relay is interrupted thus stopping the current to the pump motor. The platform then "drifts" downward to ground level, during which, at some position, the Drift-Out microswitch is activated. The Drift-In microswitch is deactivated during the deploy movement of the platform. Note, however, that neither of the other 2 microswitches have any bearing on the deploy sequence.

Deployed Position: When the ramp is in the deployed position, the Drift-Out and Counter microswitches are activated. In contrast, the Drift-In microswitch is deactivated.

Stow Sequence: When the ramp is in the deployed position, the Drift-In microswitch is deactivated, allowing current to pass from the vehicle Stow switch circuit and energize the ramp Stow Relay, which directs current to the Bidirectional Pump motor in direction B (hydraulically drives cylinder to stow ramp).

When the ramp's platform reaches the Drift-Out limit (approx. 45° above ground level) and deactivates the microswitch, the current to the Stow Relay will be interrupted.

"Y" Models Only: When the ramp's platform reaches the Drift-In limit (approx. 15° above vehicle floor level), the microswitch is activated and the current to the Stow Relay is interrupted thus stopping the current to the pump motor. The platform then "drifts" downward to the vehicle floor. The Drift-Out microswitch is also deactivated during the stow movement of the platform

Electrical (Continued)

Drift In Microswitch (Cam 1 - All RA300 Models)

Turn Cam #1 counter-clockwise to start Drift In function sooner (shut pump off).

Turn Cam #1 clockwise to start Drift In function later (allow ramp to stow further before pump shuts off).

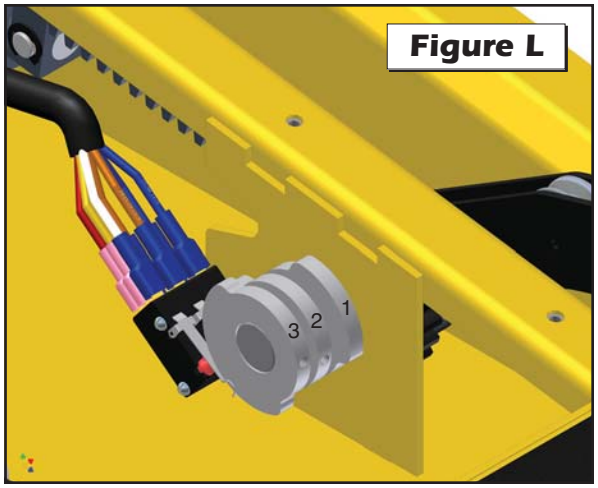


Figure L

Drift Out Microswitch (Cam 2 - All RA300 Models)

Turn Cam #2 clockwise to start Drift Out function sooner (shut pump off).

Turn Cam #2 counter-clockwise to start Drift Out function later (allow ramp to deploy further before pump shuts off).

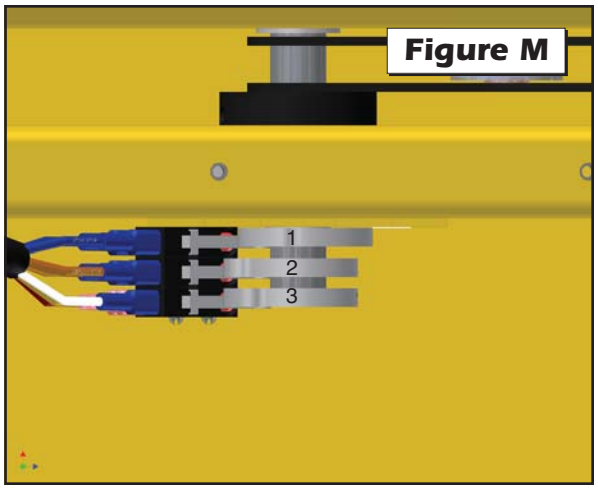


Figure M

Counter Microswitch (Cam 3 - All RA300 Models)

Turn Cam #3 clockwise to start Interlock sooner.

Turn Cam #3 counterclockwise to return Interlock signal later.

Power Down Microswitch (Cam 3 - "YP" Models Only)

Turn Cam #3 clockwise to begin power down sooner.

Turn Cam #3 counterclockwise to delay power down.

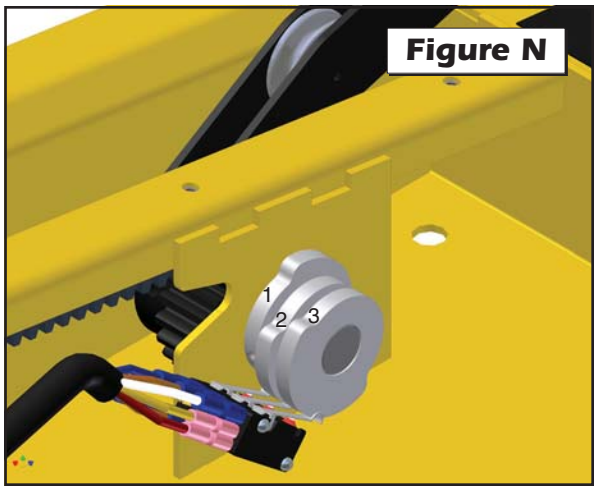


Figure N

Hydraulics

M-2202-0102 Hydraulic Pump: Fixed displacement external gear type hydraulic pump with 12 VDC electric motor and 76 cubic inch fluid reservoir for 12V BF3248Y and 12V BF3748Y. The Braun Pump Code for 12 volt M-2202-0102 pumps is **59**.

M-2202-0102 Hydraulic Pump: Fixed displacement external gear type hydraulic pump with 24 VDC electric motor and 76 cubic inch fluid reservoir for 24V BF3248Y and 24V BF3748Y. The Braun Pump Code for 24 volt M-2202-0102 pumps is **60**.

B-3202-0100 Hydraulic Pump: Fixed displacement external gear type hydraulic pump with 12 VDC electric motor and 76 cubic inch fluid reservoir for 12V BF3248YP. The Braun Pump Code for 12 volt B-3202-0100 pumps is **67**.

All RA300 Hydraulic Pumps: The Deploy pressure relief valve is factory set at 1000 psi. The Stow pressure relief valve is factory set at 1250 psi.

Hydraulic Fluid: Use Braun 32840-QT (Exxon® Univis HVI 26) hydraulic fluid. **Do not mix** with Dextron III or other hydraulic fluids. Make sure the **ramp** is **fully deployed** when checking fluid level or adding fluid. Fill to within 1" of the top of the reservoir. **DO NOT** use a solid plug or fill cap without a breather hole. Doing so will result in pump and/or reservoir damage.

Contamination: Fluid should be changed if there is visible contamination. Inspect the hydraulic system (cylinder, hoses, fittings, seals, etc.) for leaks if fluid level is low.

Deploy and Stow Pressure Relief Valves

These adjustments on the pump unit limit the maximum oil pressure in the system to a safe level. It also keeps the amp draw and battery drain at a minimum when the cylinders reach full stroke.

⚠WARNING

Contact The Braun Corporation before adjusting hydraulic pressure relief valve. Failure to do so may result in serious bodily injury and/or property damage.

The Deploy pressure relief valve is preset at 1000 psi. The Stow pressure relief valve is preset at 1250 psi. **Do not** tamper with this adjustment unless absolutely necessary (will not stow or deploy ramp) and then, **only** after contacting The Braun Corporation. **Note:** The fixed nut on each adjustment Allen screw is positioned to limit oil pressure to a maximum (Deploy relief valve maximum 1450 psi and Stow relief valve maximum 1700 psi). **Do not** attempt to loosen or remove the outer fixed nut.

Relief Valve Access: The ramp pan cover (sub-floor) must be removed to access the relief valve (access hole not provided).

Relief Valve Adjustment Procedure

1. Insert a 3/16” Allen wrench into the Allen screw. Secure the Allen screw and loosen the hex jam nut (inside nut). Back jam nut out to outer fixed nut. **Note: Do not** attempt to loosen or remove the outer fixed nut.

2. Place load on platform (equal to weight not lifting).

3. Turn the Allen screw clockwise until pump lifts the load.

4. Secure the Allen head screw and tighten the hex jam nut (inside nut) **securely**.

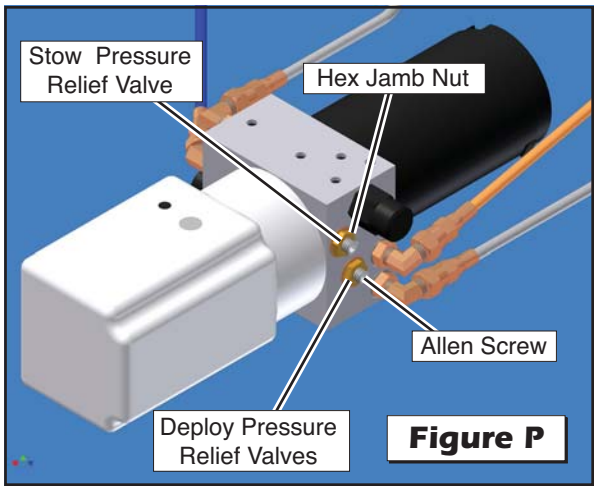


Figure P

Drift IN and OUT Cam Adjustment Procedures ("Y" Ramp Models Only)

RA300 ramp models featuring gravity down deploy and stow "drift" are equipped with adjustment cams (BF3248Y and BF3748Y). Adjust drift speed as detailed below (not applicable for "YP" models).

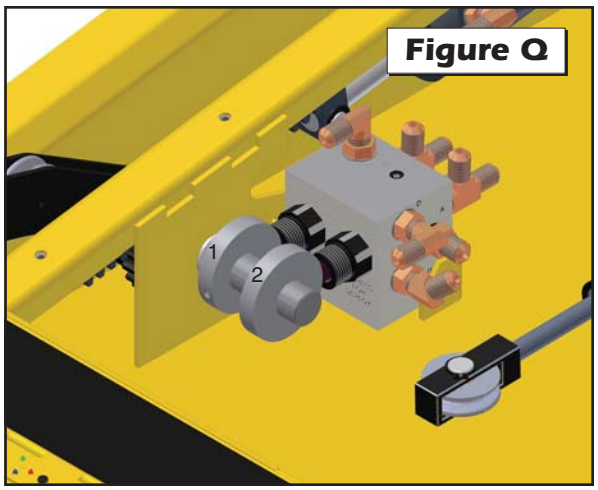


Figure Q

Drift OUT Speed (Cam 1):

Drift out cam controls the speed that the ramp moves when the ramp is almost fully deployed and the motor shuts off.

1. Loosen the set screw in the drift out cam.
2. Rotate clockwise to slow down the deployment and counter-clockwise to speed up the deployment of the ramp.
3. Tighten set screw.
4. Test deployment speed.

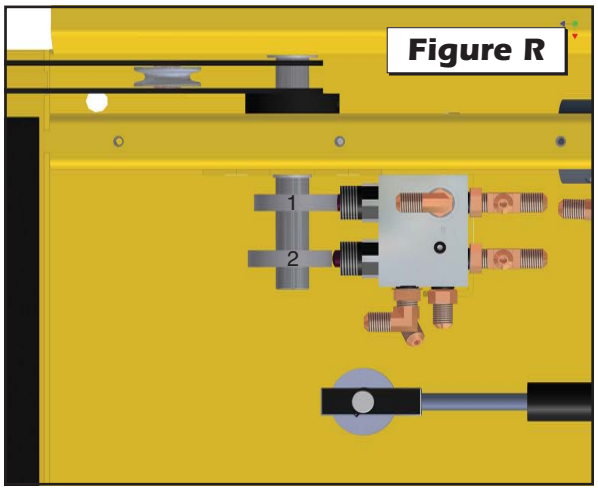


Figure R

Drift IN Speed (Cam 2):

Drift in cam controls the speed that the ramp moves when the ramp is almost fully stowed and the motor shuts off.

1. Loosen the set screw in the drift in cam.
2. Rotate counter-clockwise to slow down the stowing and clockwise to speed up the stowing of the ramp.
3. Tighten set screw.
4. Test stow speed.

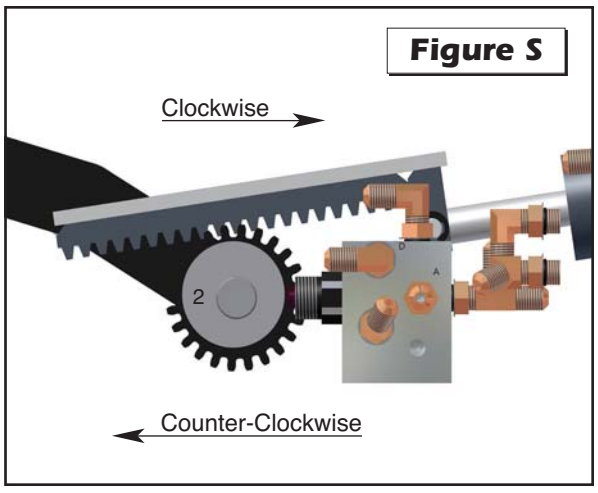


Figure S

TROUBLESHOOTING

Troubleshooting Diagnosis Chart

⚠WARNING

Troubleshooting and repair procedures must be performed as specified by an authorized service technician only. Failure to do so may result in serious bodily injury and/or property damage.

If a problem occurs with your ramp, **discontinue operation immediately!** Contact your sales representative or call The Braun Corporation at 1-800-THE LIFT®. One of our national Product Support representatives will direct you to an authorized service technician who will inspect your ramp.

The cause of the problem can be determined by locating the lift function and related symptom in the Troubleshooting Diagnosis Chart. The specific cause and remedy can then be determined by process of elimination. Wiring Diagrams, Electrical Schematics, Hydraulic Diagrams and Hydraulic Schematics are provided to aid in troubleshooting.

A Repair Parts section with an exploded view and corresponding parts list is also provided. Correct the problem if possible. If the problem continues, contact The Braun Corporation.

FUNCTION	SYMPTOM	POSSIBLE CAUSE	REMEDY
1.00 NO OPERATION	**1.10 No Power To Ramp (Circuit Problem)**	1.11 Battery terminals dirty	Clean and tighten
		1.12 Chassis ground connection (frame ground cables)	Clean and tighten. See **Chassis Ground Corrosion** on page 18.
		1.13 Battery damaged	Replace
		1.14 Battery discharged	Charge battery
		1.15 25 ampere in-line fuse faulty	Replace fuse
		1.16 Power cable	Check for loose terminals or broken wire
		1.17 Vehicle Interlock(s) circuit incomplete	Correct or replace
		1.18 Vehicle-to-ramp wiring harness	Disconnect harness from ramp. Using volt meter, test (probe) 8-pin Deutsch male plug terminals as follows: Pin A = +12/24 V Pin B = -Ground Pin C = V (when Stow switch is activated) Pin D = V (when Deploy switch is activated)
	1.20 Power to Ramp But No Pump Operation	1.21 Ramp wiring harness	Remove relays from sockets. Using volt meter, test (probe) wires/terminals at relay sockets: Red = +12/24 V Black = -Ground Blue = V (when Stow switch is activated) Orange = V (when Deploy switch is activated)
		1.22 Faulty relay(s)	Replace
		1.22 Loose connection(s)	Clean and tighten
		1.24 Broken wire(s)	Repair
		1.25 Wire terminal(s)	Crimp tightly to wire
2.00 DEPLOY (Out)	**2.10 No Operation**	2.11 See 1.00	
		2.12 Drift Out Microswitch out of adjustment or damaged	See Microswitches in Systems Descriptions for details
		2.13 Drift Out Microswitch harness disconnected, damaged or otherwise damaged	Connect, repair or replace
		2.14 Pump motor brushes worn	Contact Braun Product Support - replace pump

continued

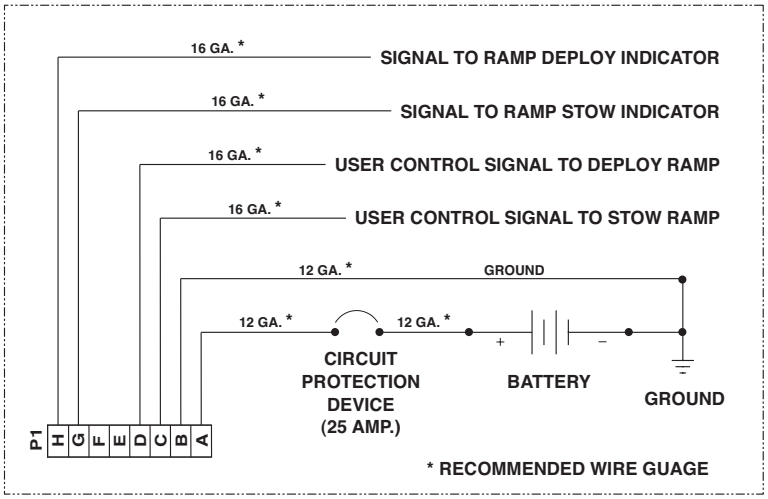
FUNCTION	SYMPTOM	POSSIBLE CAUSE	REMEDY
continued	continued		
2.00 DEPLOY (Out)	2.20 Locked in Intermediate Position (No Response to Deploy Switch/No Drift Out)	2.21 Ramp was stopped within the Deploy "Drift Out" range during Stow function	Activate Stow function until ramp is out of the Deploy "Drift Out" range. Then activate Deploy function.
	2.30 Pump Runs But Doesn't Deploy	2.31 Physical obstruction (20 lb or more) on ramp	Remove obstruction
		2.32 Mechanical binding	Check and correct
		2.33 Deploy pressure relief valve setting too low	Adjust relief valve setting. See Systems Descriptions for details.
		2.34 Low hydraulic fluid supply. **Note:** Fluid should be changed if there is visible contamination. Inspect the hydraulic system for leaks if fluid level is low.	Use Braun 32840-QT (Exxon® Univis HVI 26) hydraulic fluid (**do not mix** with Dextron III or other hydraulic fluids). Check oil level with **ramp fully deployed**. See Systems Descriptions for details.
		2.35 Leak in hydraulic system	Repair
		2.36 Cylinder leak	Replace.
		2.37 Deploy pressure relief valve stuck open due to contamination or otherwise damaged	Contact Braun Product Support - replace pump
		2.38 Pump internal shuttle valve stuck or damaged	Contact Braun Product Support - replace pump
	2.40 Faulty or Sluggish Operation	2.41 Lack of lubrication (drive arm assembly pivot pins and shaft)	Lubricate pivot pins. See Maintenance and Lubrication Schedule and Diagram
		2.42 Misalignment or damage to: • Drive arm and/or pivot pins • Linkage arms and/or pivot pins • Drive arm and cam gear shaft • Cylinder rack gear and/or cam gear	Correct/Replace/Lubricate. See Maintenance and Lubrication Schedule and Diagram
		2.43 Mechanical binding	Check and correct
		2.44 Restriction in hydraulic lines	Check for contamination or kinks - correct or replace
		2.45 Hydraulic fluid too thick due to cold climate	Thin with Diesel fuel - 2 T. Change in spring. See Systems Descriptions for full-time cold climate specifications
	2.50 Drifts Excessively Slow (or No Drift)	2.51 See 2.38 and 2.40	
		2.52 Pump internal orifice plugged or damaged	Contact Braun Product Support - replace pump
		2.53 Drift out cam needs adjustment	See drift cam adjustment procedure
	2.60 Drifts Excessively Fast	2.61 See 2.35 and 2.36	
		2.62 Pump internal orifice enlarged or damaged	Contact Braun Product Support - replace pump
		2.64 Drift our cam needs adjustment	See drift cam adjustment procedure

TROUBLESHOOTING

FUNCTION	SYMPTOM	POSSIBLE CAUSE	REMEDY
3.00 STOW (In)	3.10 No Operation	3.11 See 1.00 3.12 Drift In Microswitch out of adjustment or damaged 3.13 Drift In Microswitch harness disconnected, damaged or otherwise damaged	Adjust or replace. See Microswitches in Systems Descriptions for details Connect, repair or replace
	3.20 Locked in Intermediate Position (No Response to Stow Switch/No Drift In)	3.21 Ramp was stopped within the Stow "Drift In" range during Deploy function ("Y" models only)	Activate Deploy function until ramp is out of the Stow "Drift In" range. Then activate Stow function.
	3.40 Pump Runs But Doesn't Stow	3.41 See 2.31, 2.32, 2.34, 2.35 and 2.36 3.42 Stow pressure relief valve setting too low 3.43 Stow pressure relief valve stuck open due to contamination or otherwise damaged	Adjust relief valve setting. See Systems Descriptions for details. Contact Braun Product Support - replace pump
	3.50 Faulty or Sluggish Operation	4.51 See 2.40	
	3.60 Drifts Excessively Slow (or No Drift)	4.61 See 2.40 and 2.50	
	3.70 Drifts Excessively Fast	4.71 See 2.35, 2.36 and 2.62	

Electrical Schematic - BF3248Y & BF3748Y

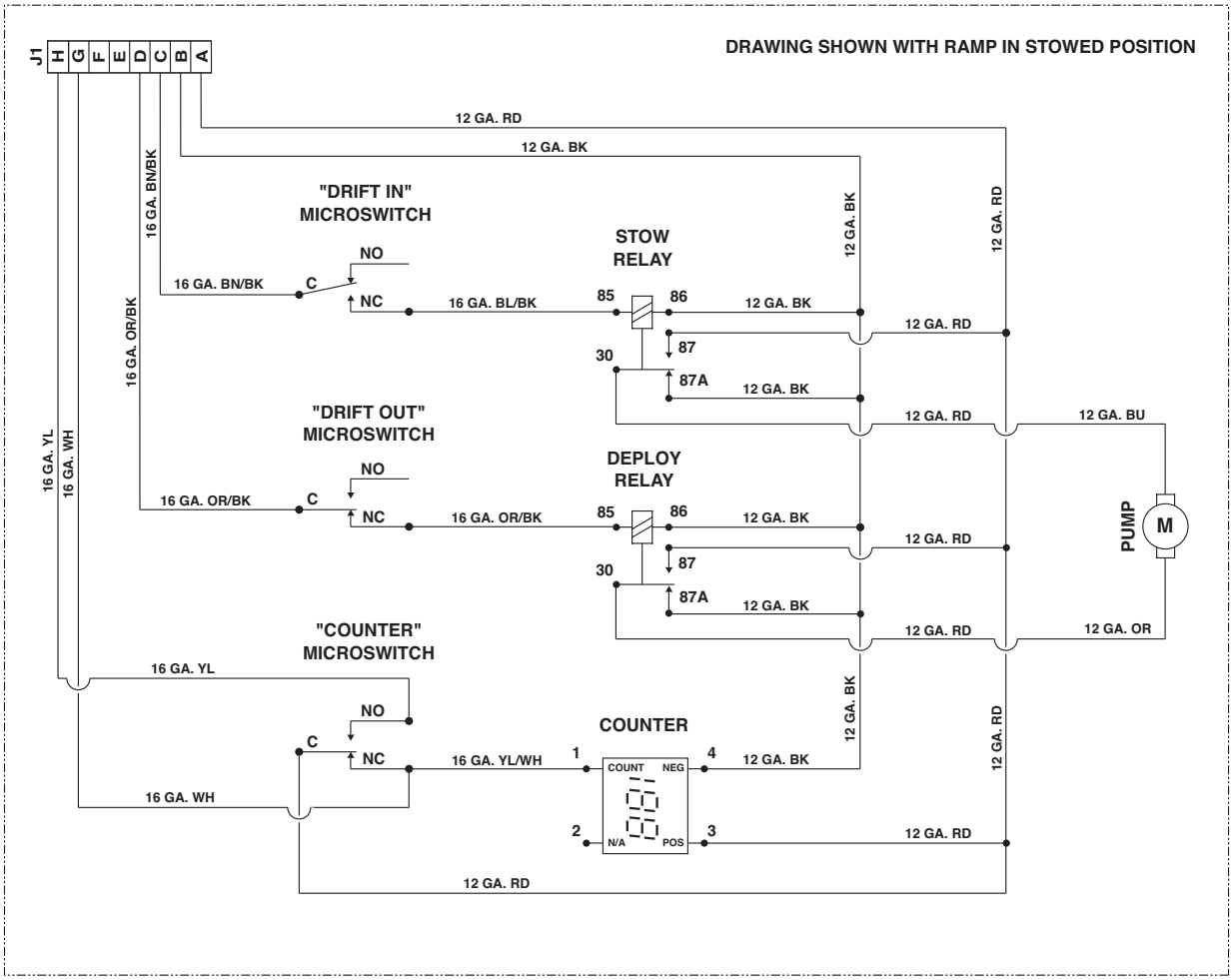
POWER CONNECTIONS / CONTROL SIGNALS (PROVIDED BY INSTALLER)



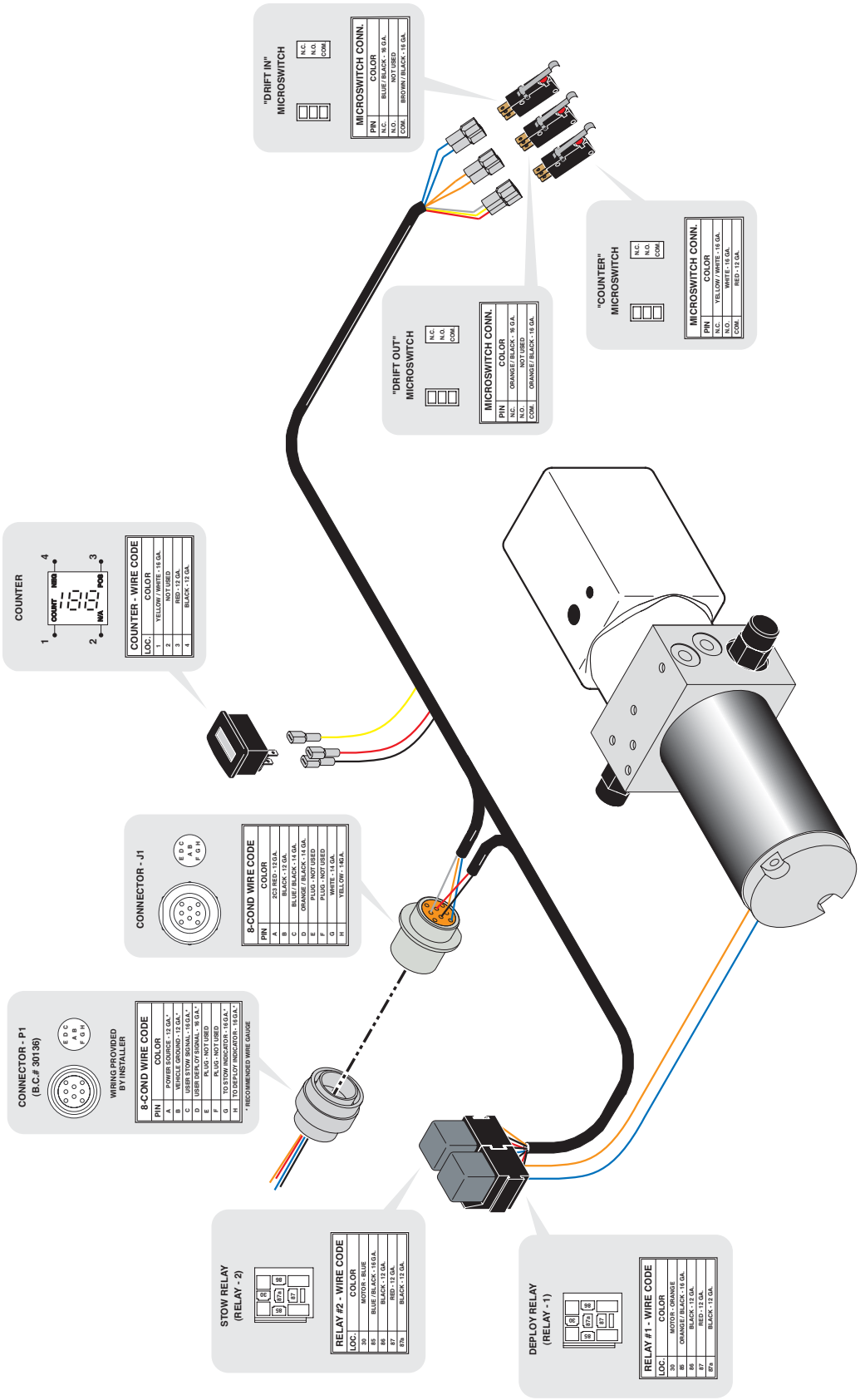
SYMBOL KEY

DESCRIPTION	SYMBOL
BATTERY	
CHASSIS GROUND	
CIRCUIT PROTECTION DEVICE	
JUNCTION	
MICROSWITCH	
RELAY	
MOTOR	
COUNTER	

RA300 TRANSIT RAMP ASSEMBLY

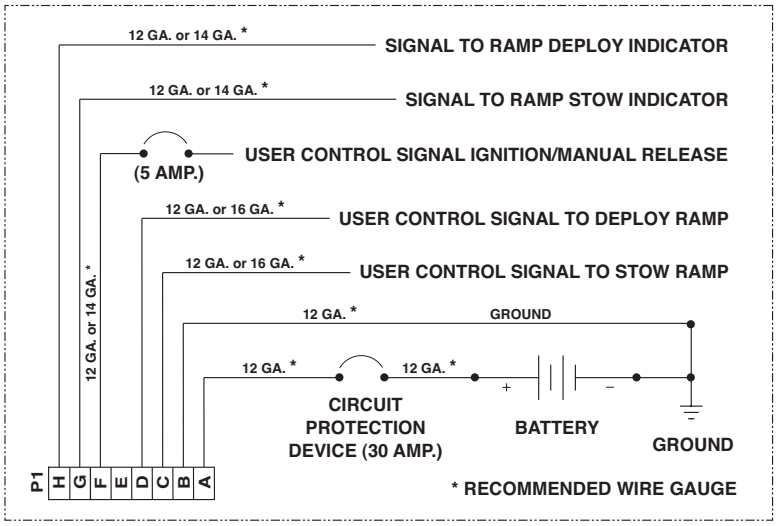


Wiring Diagram - BF3248Y & BF3748Y



Electrical Schematic - BF3248YP

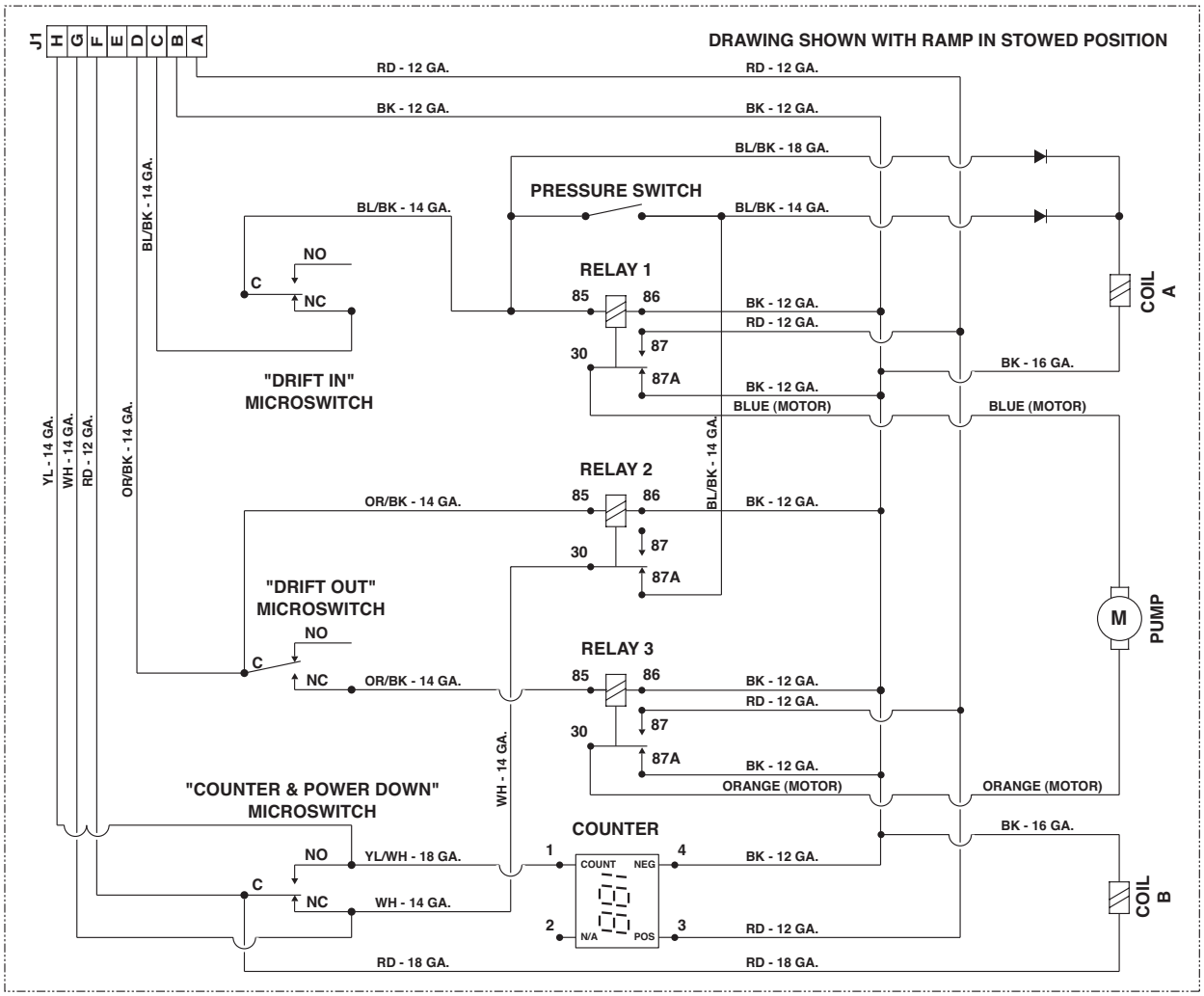
POWER CONNECTIONS / CONTROL SIGNALS (PROVIDED BY INSTALLER)


12 GA. or 14 GA. *
SIGNAL TO RAMP DEPLOY INDICATOR
12 GA. or 14 GA. *
SIGNAL TO RAMP STOW INDICATOR
(5 AMP.)
USER CONTROL SIGNAL IGNITION/MANUAL RELEASE
12 GA. or 16 GA. *
USER CONTROL SIGNAL TO DEPLOY RAMP
12 GA. or 16 GA. *
USER CONTROL SIGNAL TO STOW RAMP
12 GA. or 14 GA. *
12 GA. *
GROUND
12 GA. *
12 GA. *
CIRCUIT PROTECTION DEVICE (30 AMP.)
BATTERY
GROUND
P1
H G F E D C B A
* RECOMMENDED WIRE GAUGE

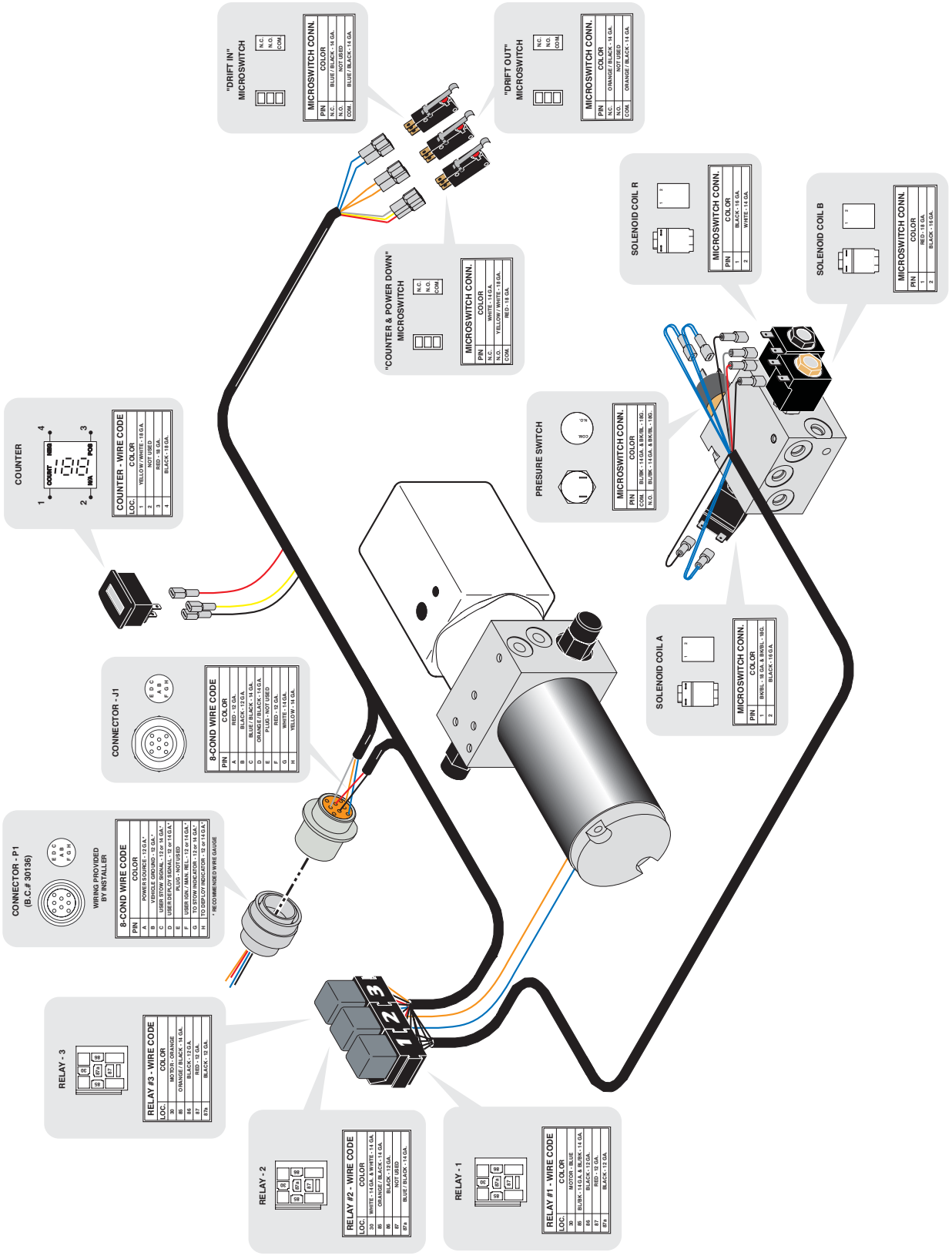
SYMBOL KEY

DESCRIPTION	SYMBOL
BATTERY	
CHASSIS GROUND	
CIRCUIT PROTECTION DEVICE	
JUNCTION	
MICROSWITCH	
RELAY	
COIL	
DIODE	
MOTOR	
COUNTER	

RA300 TRANSIT RAMP ASSEMBLY



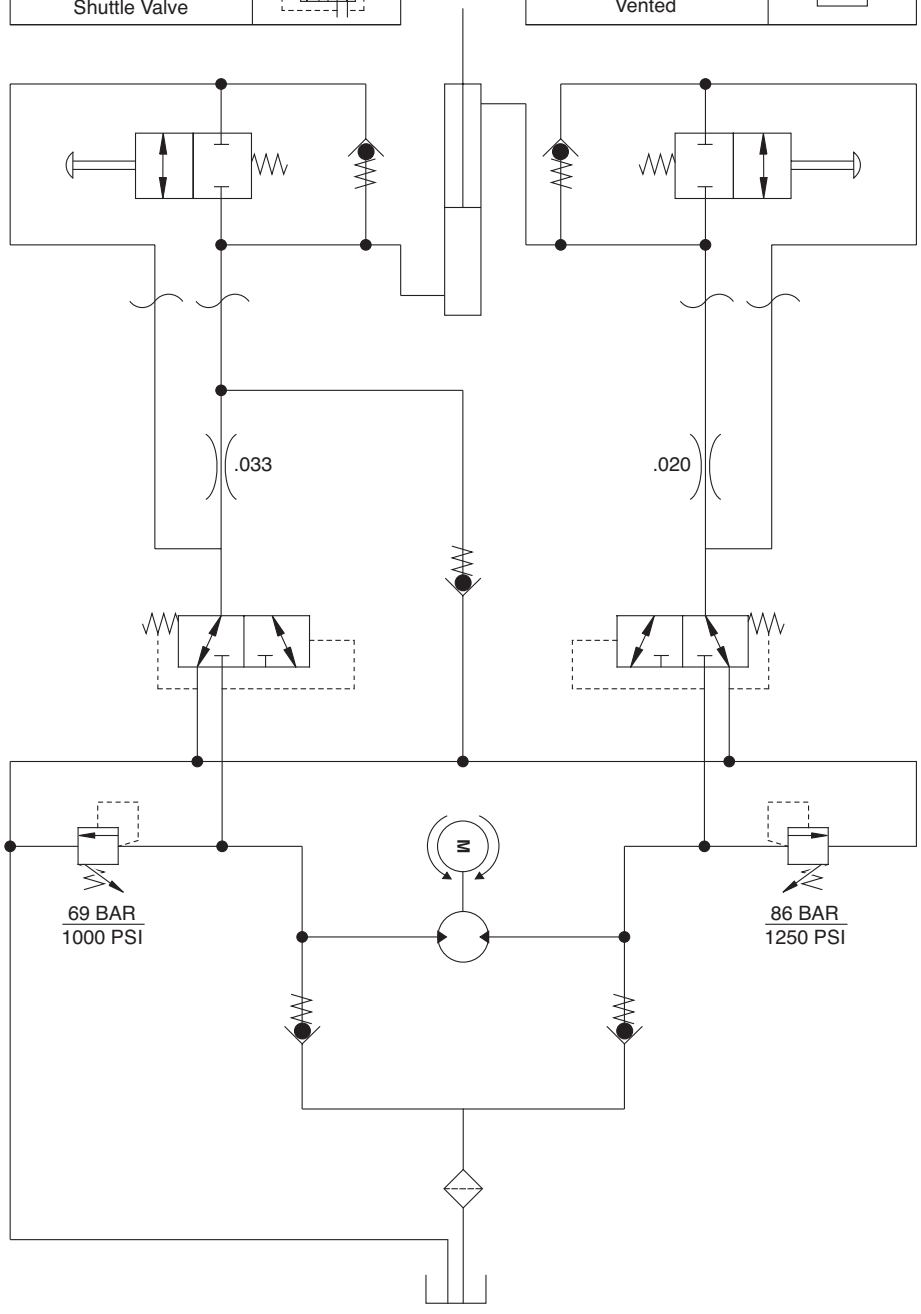
Wiring Diagram - BF3248YP


"DRIFT IN" MICROSWITCH
N.C.
N.O.
COM
MICROSWITCH CONN.
PIN | COLOR
N.C. | BLUE / BLACK - 14 GA.
N.O. | NOT USED
COM. | BLUE / BLACK - 14 GA.
"DRIFT OUT" MICROSWITCH
N.C.
N.O.
COM
MICROSWITCH CONN.
PIN | COLOR
N.C. | ORANGE / BLACK - 14 GA.
N.O. | NOT USED
COM. | ORANGE / BLACK - 14 GA.
"COUNTER & POWER DOWN" MICROSWITCH
N.C.
N.O.
COM
MICROSWITCH CONN.
PIN | COLOR
N.C. | WHITE - 14 GA.
N.O. | YELLOW / WHITE - 18 GA.
COM. | RED - 18 GA.
SOLENOID COIL R
MICROSWITCH CONN.
PIN | COLOR
1 | BLACK - 18 GA.
2 | WHITE - 14 GA.
SOLENOID COIL B
MICROSWITCH CONN.
PIN | COLOR
1 | RED - 18 GA.
2 | BLACK - 18 GA.
PRESURE SWITCH
NC
COM
NO
MICROSWITCH CONN.
PIN | COLOR
COM. | BLUE - 14 GA. & BK/BL - 18G.
N.O. | BLUE - 14 GA. & BK/BL - 18G.
COUNTER
COUNT
RUN
PGM
MIN
COUNTER - WIRE CODE
LOC. | COLOR
1 | YELLOW / WHITE - 18 GA.
2 | NOT USED
3 | RED - 18 GA.
4 | BLACK - 18 GA.
CONNECTOR - J1
8-COND WIRE CODE
PIN | COLOR
A | RED - 12 GA.
B | BLACK - 12 GA.
C | BLUE / BLACK - 14 GA.
D | ORANGE / BLACK - 14 GA.
E | NOT USED
F | RED - 12 GA.
G | WHITE - 14 GA.
H | YELLOW - 14 GA.
CONNECTOR - P1 (B.C.# 30136)
WIRING PROVIDED BY INSTALLER
8-COND WIRE CODE
PIN | COLOR
A | POWER SOURCE - 12 GA.*
B | VEHICLE GROUND - 12 GA.*
C | USER DEPLOY SIGNAL - 14 GA.*
D | USER DEPLOY SIGNAL - 12 or 14 GA.*
E | PLUG - NOT USED
F | USER 10K / MAX. REL. - 12 or 14 GA.*
G | TO STOW INDICATOR - 12 or 14 GA.*
H | TO STOW INDICATOR - 12 or 14 GA.*
*RECOMMENDED WIRE GAUGE
RELAY - 3
RELAY #3 - WIRE CODE
LOC. | COLOR
30 | WIRE - 12 GA.
85 | ORANGE / BLACK - 14 GA.
86 | BLACK - 12 GA.
87 | RED - 12 GA.
87a | BLACK - 12 GA.
RELAY - 2
RELAY #2 - WIRE CODE
LOC. | COLOR
30 | WHITE - 14 GA. & WHITE - 14 GA.
85 | ORANGE / BLACK - 14 GA.
86 | BLACK - 12 GA.
87 | NOT USED
87a | BLUE / BLACK - 14 GA.
RELAY - 1
RELAY #1 - WIRE CODE
LOC. | COLOR
30 | WIRE - BLUE
85 | BLUE - 14 GA. & BLUE - 14 GA.
86 | BLACK - 12 GA.
87 | RED - 12 GA.
87a | BLACK - 12 GA.
SOLENOID COIL A
MICROSWITCH CONN.
PIN | COLOR
1 | BK/BL - 18 GA. & BK/BL - 18G.
2 | BLACK - 18 GA.

Hydraulic Schematic - BF3248Y & BF3748Y

Description	Symbol
Pump, Bidirectional Displacement	
Pump Motor, Bidirectional	
Flow Control Valve	
Fixed Orifice	
3 Way 2 Position Shuttle Valve	

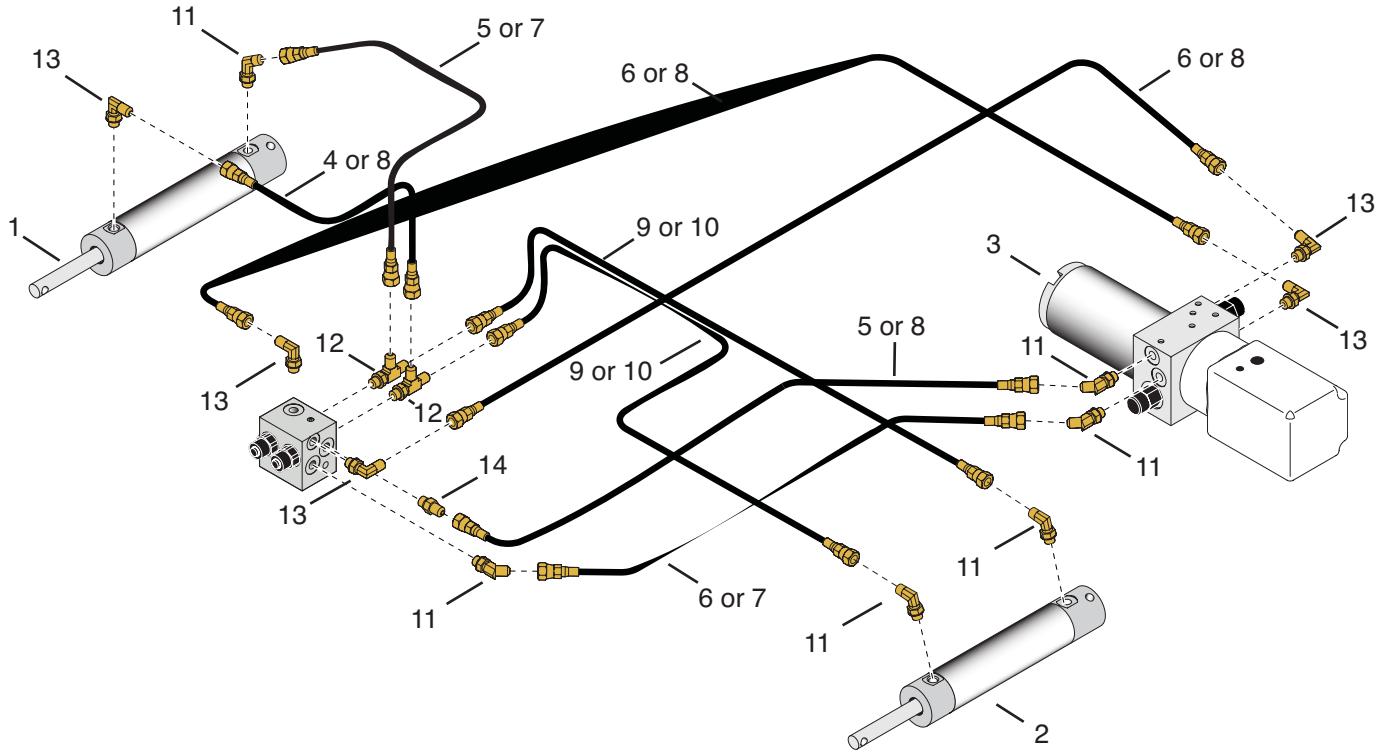
Cylinder, Double Acting	
Relief Valve	
Check Valve	
Hydraulic Port	
Filter Screen	
Reservoir, Vented	



Hydraulic Diagram and Parts List - BF3248Y and BF3748Y

Item	Qty.	Description	BF3248Y	BF3748Y
1	1	Cylinder - 1514.3 - Compact	C1514.3-9800	C1514.3-9800
2	1	Cylinder - 1514.3 - Compact	C1514.3-9900	C1514.3-9900
3	1	Pump - Power Unit - Hydraulic - RA300	31698-12V or 24V*	31698-12V or 24V*
4	1	Hose Assembly - 6" - 1/8" Dia - SW/SW	16004A-006	-
5	2	Hose Assembly - 10" - 1/8" Dia - SW/SW	16004A-010	-
6	3	Hose Assembly - 12" - 1/8" Dia - SW/SW	16004A-012	-
7	2	Hose Assembly - 12" - 1/8" Dia - SW/SW	-	16004A-012
8	4	Hose Assembly - 16" - 1/8" Dia - SW/SW	-	16004A-016
9	2	Hose Assembly - 28" - 1/8" Dia - SW/SW	16004A-028	-
10	2	Hose Assembly - 36" - 1/8" Dia - SW/SW	-	16004A-036
11	6	Elbow - 45* - 7/16-20 + 7/16-20 SAE Male O-Ring	24505	24505
12	2	Tee - 7/16 O-Ring RUN - 7/16 M. JIC37*	24505	24505
13	5	Elbow - 7/16-20 M/O-Ring/37*	25085	25085
14	1	Fitting - 7 /16-20 - 7/16-20 - 37*	24504	24504

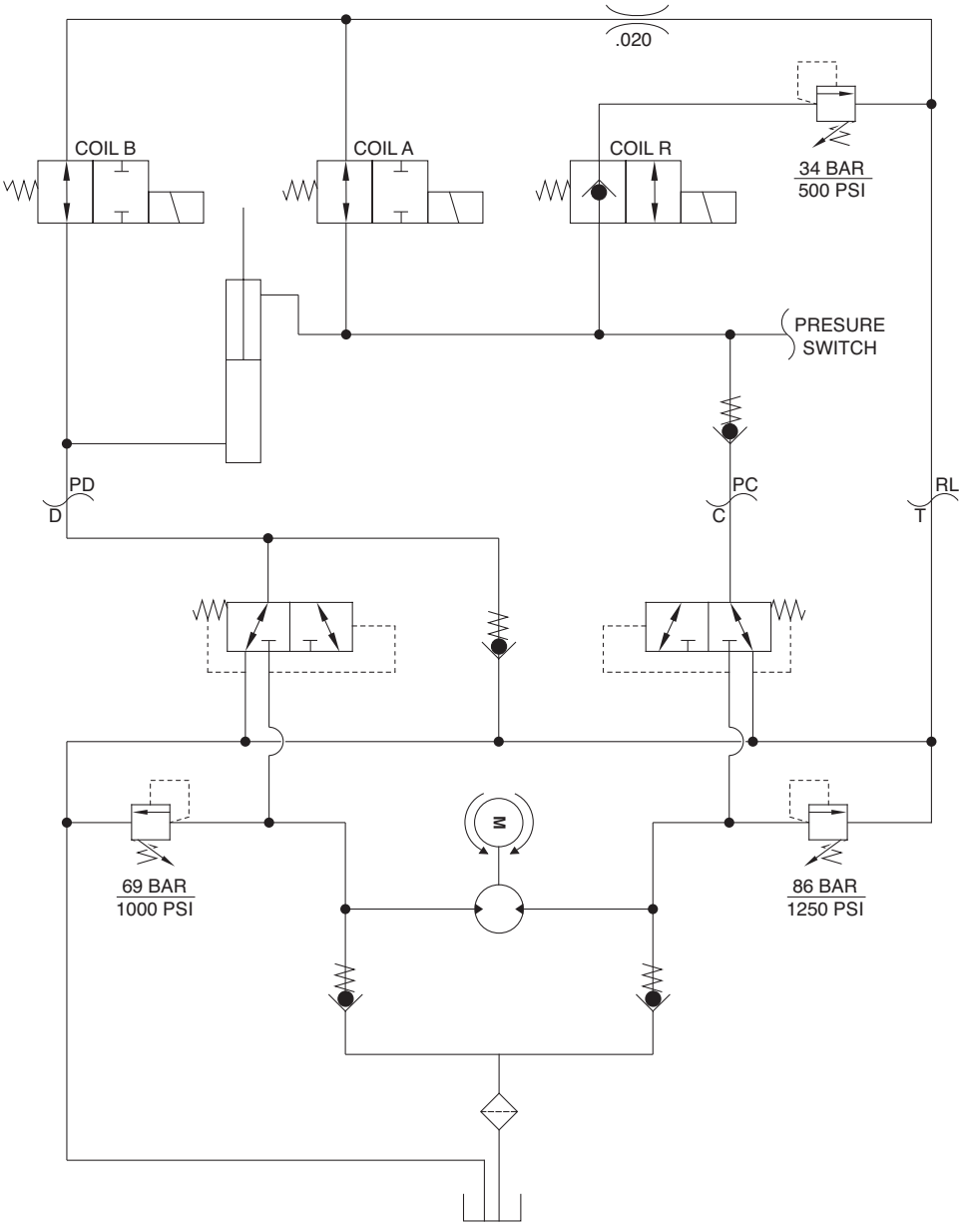
* Optional 24V Model Ramp



Hydraulic Schematic - BF3248YP

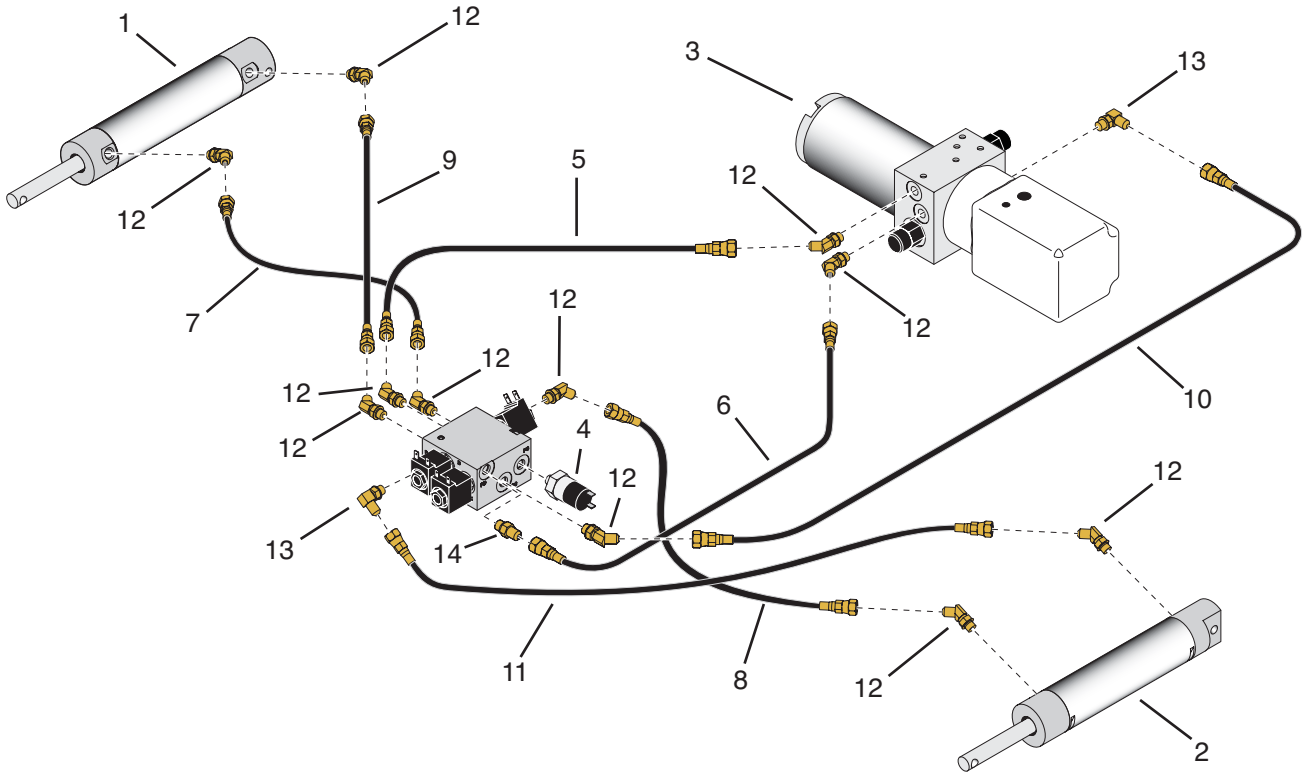
Description	Symbol
Pump, Bidirectional Displacement	
Pump Motor, Bidirectional	
Flow Control Valve	
Fixed Orifice	
3 Way 2 Position Shuttle Valve	

Cylinder, Double Acting	
Relief Valve	
Check Valve	
Hydraulic Port	
Filter Screen	
Reservoir, Vented	



Hydraulic Diagram and Parts List - BF3248YP

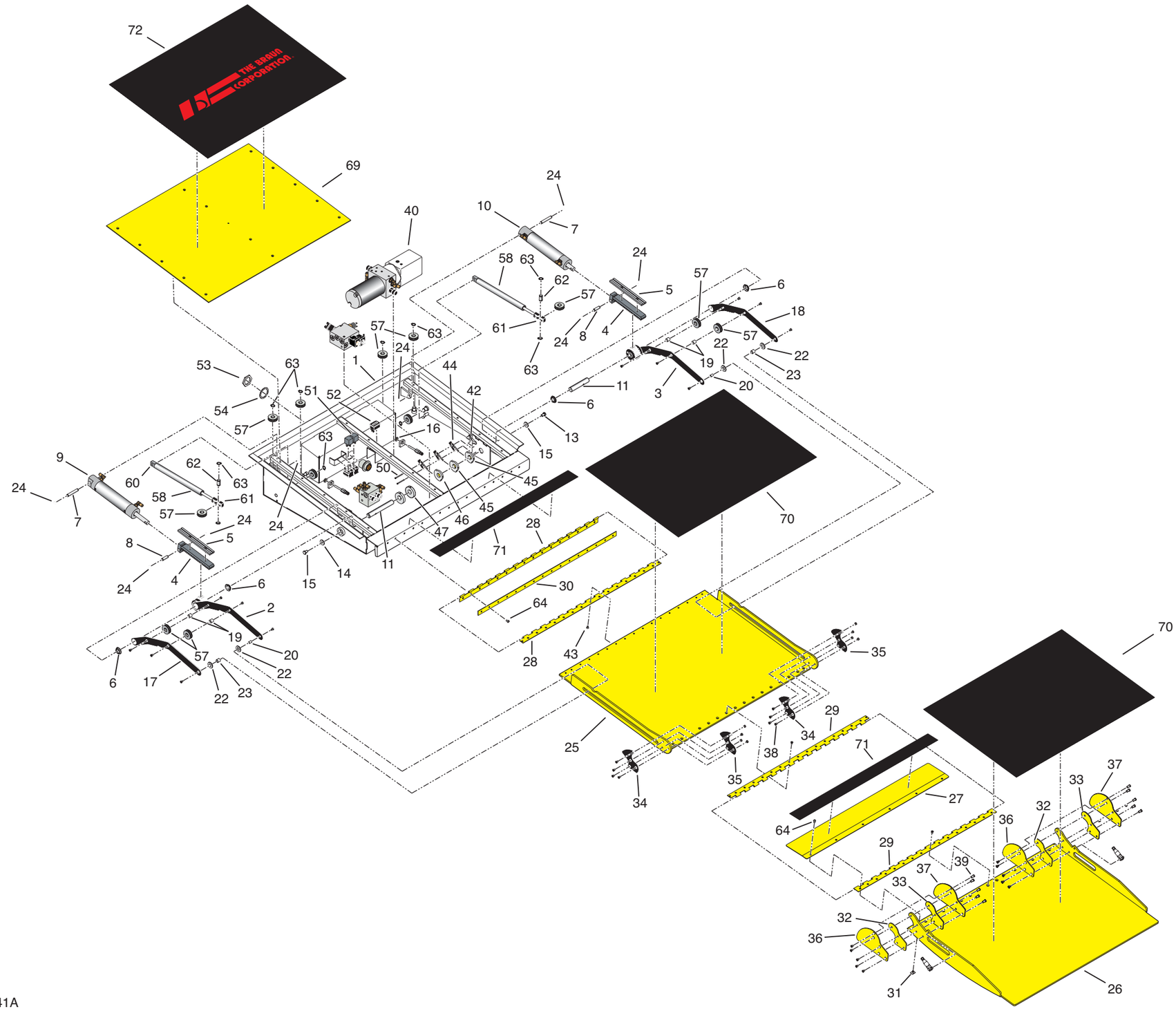
Item	Qty.	Description	BF3248YP
1	1	Cylinder - 1514.3 - Compact	C1514.3-9800
2	1	Cylinder - 1514.3 - Compact	C1514.3-9900
3	1	Pump - Power Unit - 12V Hydraulic - RA300	33364
4	1	Switch - Pressure	31199
5	1	Hose Assembly - 8" - 1/8" Dia - SW/SW	16004A-008
6	1	Hose Assembly - 10" - 1/8" Dia - SW/SW	16004A-010
7	1	Hose Assembly - 12" - 1/8" Dia - SW/SW	16004A-012
8	1	Hose Assembly - 16" - 1/8" Dia - SW/SW	16004A-016
9	1	Hose Assembly - 20" - 1/8" Dia - SW/SW	16004A-020
10	1	Hose Assembly - 22" - 1/8" Dia - SW/SW	16004A-022
11	1	Hose Assembly - 26" - 1/8" Dia - SW/SW	16004A-026
12	11	Elbow - 45* - 7/16-20 + 7/16-20 SAE Male O-Ring	24505
13	2	Elbow - 7/16-20 M/O-Ring/37*	25085
14	1	Fitting - 7 /16-20 - 7/16-20 - 37*	24504



REPAIR PARTS

Item	Qty.	Description	BF3248Y	BF3748Y	BF3248YP
1	1	Pan - Weldment	BF00267WY	BF37304WY	BF00267WY
2	1	Drive Arm - Left - Weldment	BF00261LWBKN	BF00261LWBKN	BF00261LWBKN
3	1	Drive Arm - Right - Weldment	BF00261RWBKN	BF00261RWBKN	BF00261RWBKN
4	2	Gear Rack - Weldment	RA40402WBKN	RA40402WBKN	RA40402WBKN
5	2	Bearing Strip	RA40105	RA40105	RA40105
6	4	Bearing - Flange - 3/4" x 1/4" - 12FDU04	24012	24012	24012
7	2	Pin - Cylinder Mount	BF00067	BF00067	BF00067
8	2	Pin - Cylinder / Rack	RA40002	RA40002	RA40002
9	1	Cylinder - 1514.3 - Compact	C1514.3-9800	C1514.3-9800	C1514.3-9800
10	1	Cylinder - 1514.3 - Compact	C1514.3-9900	C1514.3-9900	C1514.3-9900
11	2	Shaft - Main Pivot	BF00239	BF00239	BF00239
12 *	2	Nut - 1/4-20 Nylock - Auto Black	14614	14614	14614
13 *	2	Bolt - 1/4-20 x 2 1/2" Hex	10004	10004	10004
14	2	Washer - Shaft Main Pivot	BF00248	BF00248	BF00248
15	2	Bolt - 5/16-18 x 1/2" 316 SS Hex	BF00251	BF00251	BF00251
16	2	Washer - Spherical SS 5/8" OD - 2pcs	BF00229	BF00229	BF00229
17	1	Drive Arm	BF00215LBKN	BF00215LBKN	BF00215LBKN
18	1	Drive Arm	BF00215RBKN	BF00215RBKN	BF00215RBKN
19	4	Shaft - Sheave	BF00238	BF00238	BF00238
20	2	Shaft - Bearing Support	BF37317	BF37317	BF37317
21 *	2	Bearing - 5/16" ID - 3/8" OD - 1/2" L	31902	31902	31902
22	4	Spacer - Drive Arm	BF00240	BF00240	BF00240
23	2	Bearing - Ramp Fold	BF00221	BF00221	BF00221
24	8	E-Clip - 3/8" Shaft	84383	84383	84383
25	1	Ramp Platform - Stage 1	BF00200Y	BF37401Y	BF00200Y
26	1	Ramp Platform - Stage 2	BF00201Y	BF37402Y	BF00201Y
27	1	Plate - Transition	BF00247Y	BF37406Y	BF00247Y
28	1	Hinge - 2" x __" - SS with PEM Nuts - 1 Row	29960PS-1Y	BF37403-1Y	29960PS-1Y
29	1	Hinge - 2" x __" - SS with PEM Nuts - 2 Rows	29960PS-2Y	BF37403-2Y	29960PS-2Y
30	1	Plate - Hinge Support	BF00013Y	BF37307Y	BF00013Y
31	6	Nut - Weld 10-32 x 9/32" Plain Slab Base	30209	30209	30209
32	2	Plate - Cable Retainer	BF00235LY	BF00235LY	BF00235LY
33	2	Plate - Cable Retainer	BF00235RY	BF00235RY	BF00235RY
34	2	Plate - Cable Retainer	BF00236LBKN	BF37404LBKN	BF00236LBKN
35	2	Plate - Cable Retainer	BF00236RBKN	BF37404RBKN	BF00236RBKN
36	2	Cable Retainer	BF00237LY	BF00237LY	BF00237LY
37	2	Cable Retainer	BF00237RY	BF00237RY	BF00237RY
38	8	Nut - #10-32 x 0.20 - Cable Retainer	BF00242	BF00242	BF00242
39	10	Nut - #10-32 x 0.49 - Cable Retainer	BF00243	BF00243	BF00243
40	1	Pump - Power Unit - __V Hydraulic - RA300	31698-12V or 24V**	31698-12V or 24V**	33364
41 *	2	Bolt - 3/8-16 x 1/2" 316SS Hex	BF00249	BF00249	BF00249
42	1	Plate - Tapped #4-40 Microswitch	24998	24998	24998
43	92	Screw - #10-32 x 3/8 FL HD-HX SKT - Auto Black	24537	24537	24537
44	3	Microswitch - Sealed	30205	30205	30205
45	2	Cam - Microswitch Adjust - Bi-Fold	BF00076	BF00076	BF00076
46	1	Cam - Microswitch Adjust	RA40506	RA40506	RA40506
47	2	Cam - Manual Valve - RA400/02	RA40500	RA40500	RA40500
48 *	3	Screw - #10-32 x 5/16" Set - Auto Black	11562	11562	11562
49 *	2	Screw - 1/4-28 x 3/8" Set	11566	11566	11566
50	2	Screw - #4-40 x 1 1/2" RD HD	11485	11485	11485
51	2	Relay - 30/40A SPDT 12V P&B Plastc. - Plug In	18087	18087	18087
52	1	Cycle Counter - LCD without Reset	30547	30547	30547
53	1	Nut - Panel - DT 114020-90	30030	30030	30030
54	1	Washer - Lock - DT 114021	30031	30031	30031
55 *	2	Cable 3/16" Nylon Coated 1/8" Cable/84"	BF00252A	BF37410A	BF00252A
56 *	2	Nut - 1/4-28 SS Hex	BF00250	BF00250	BF00250
57	12	Sheave - 3/16" Rope Dia. - Zinc/Bronze Bearing	BF00254	BF00254	BF00254
58	2	Gas Spring - 7.87" M8 x 1.25 Threaded - 25 LB	BF00255	BF00255	BF00255
59 *	2	Ring - 3/8" Retaining Snap	13889	13889	13889
60	2	Mount - Gas Spring	BF00231BK	BF00231BK	BF00231BK
61	2	Mount - Sheave - Gas Spring	BF00245BK	BF00245BK	BF00245BK
62	2	Pin - Gas Spring Sheave	BF00246	BF00246	BF00246
63	10	Ring -1/2" Ext Snap - Auto Black	20946	20946	20946
64	26	Screw - #10-32 x 1/2 BHSCS - Auto Black	30375	30375	30375
65 *	2	Nylon Loop - Manual Backup	RA40507	RA40507	RA40507
66 *	2	Washer - #10 Flat - Auto Black	11541	11541	11541
67 *	2	Nut - #10-32 with Lock Washer - Auto Black	18349	18349	18349
68 *	2	Foot - Rubber Adh Back 13/16" Sq. - Black	15759	15759	15759
69	1	Pan - Top RA300	BF00269Y	BF37411Y	BF00269Y
70	2	Antiskid Tape - __" x 21"	30081	BF37407	30081
71	2	Antiskid Tape - __" x 2.25"	30082	BF37408	30082
72	1	Antiskid Tape - __" x 22" - Red Braun Logo	30084	BF37409	30084
73 *	2	Tag - Serial# / Series# - Plastic	18548P	18548P	18548P
74 *	2	Decal - Danger Keep Clear	81819	81819	81819
75 *	1	Harness - Main Assembly	BF00080A	BF00080A	BF00081A

* Item not shown ** Optional 24V Model Ramp


THE BRAUN CORPORATION
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Unfold for:
Bifold Ramp
Exploded View

SPECIFICATION AND DIMENSIONS

Power Unit: Hydraulic Pump Module

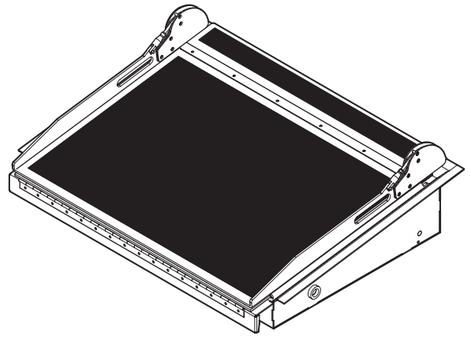
Voltage: 12 VDC (Optional 24 VDC)

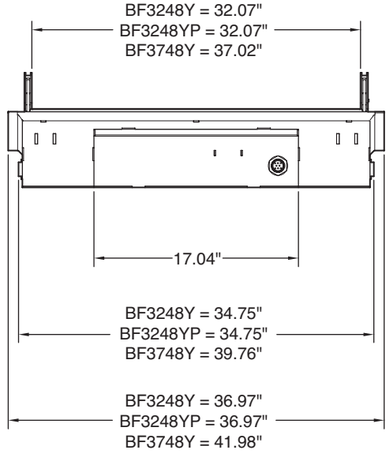
Current: 25 Amps (Max)

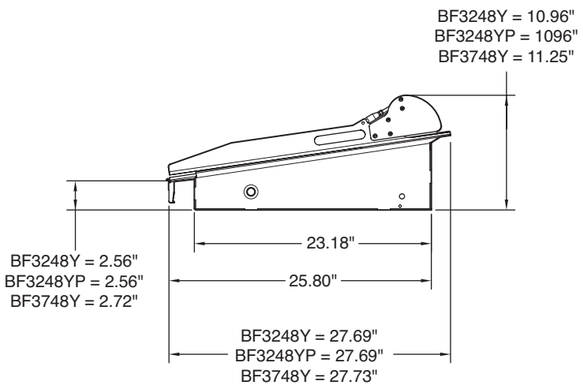
Inputs Required: +12 Volt Supply
(-) Ground
Ramp “Out” Signal (+)
Ramp “In” Signal (+)
Interlock Signal

Notes: Mounting holes/brackets per application

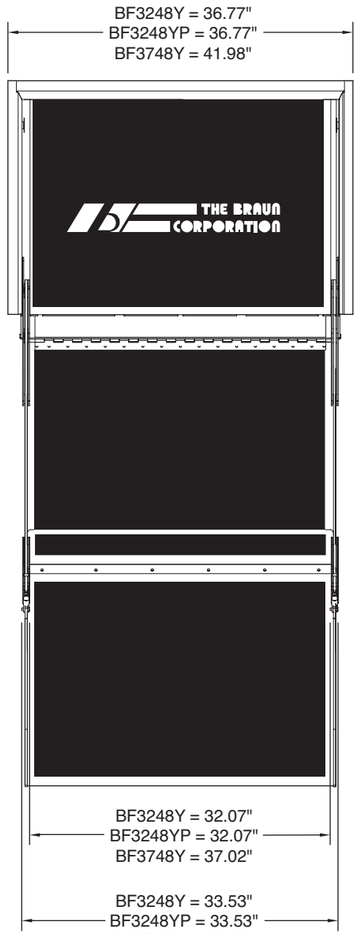
Stowed View

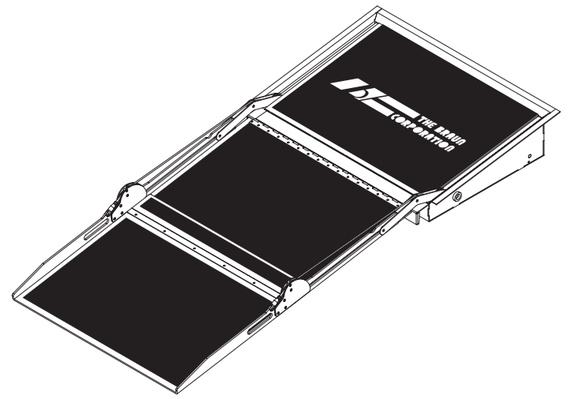


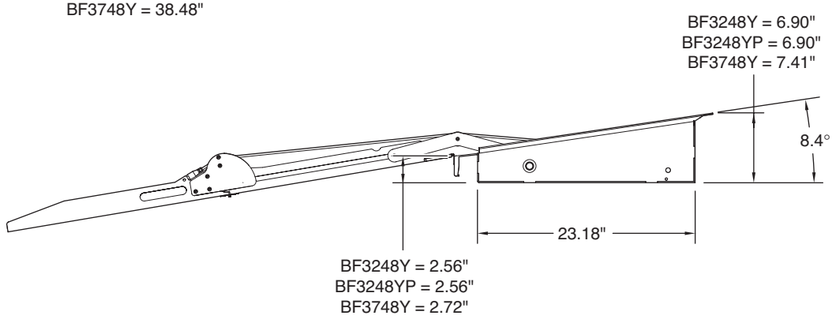




Deployed View







DAILY PREVENTIVE MAINTENANCE SCHED-

Vehicle Number: _____ Date: _____

Inspector: _____

Pre-Trip Inspection:

Before each scheduled day of lift service, operate ramp **minimum one complete cycle** and inspect each of the following :

- ☑ Do the vehicle interlock(s) function as intended?
- ☐ Does the ramp deploy when the ramp interlock is activated as intended?
- ☐ Does the lift control switch function properly?
- ☐ Does the ramp cargo door light (if equipped) function as intended?
- ☐ Do the lift cargo door securement devices function as intended (if equipped)?
- ☐ Does the ramp safely clear the cargo door as the ramp is deployed and stowed?
- ☐ Does the ramp operate smoothly (no jerking or abnormal movement)?
- ☐ Does the ramp operate at normal speed?
- ☐ Is the lift power source adequate?
- ☐ Do the drive arms clear the ramp and housing?
- ☐ Is ramp operation quiet (no rattles, abnormal sounds, etc.)?
- ☐ Are the ramp-posted decals worn, missing or illegible?
- ☐ Is the ramp antiskid in place, worn or damaged?
- ☐ Can you visually detect any ramp wear, damage, misalignment, hydraulic leaks, loose bolts, broken welds or any abnormal conditions?

Post-Trip Inspection:

Operate ramp **minimum one complete cycle** and check each of the above daily pre-trip inspections **if applicable** for your daily inspection routine (outlined by your transit agency).

- ☐ Clean ramp surfaces where wheelchairs travel
- ☐ Clean and lubricate key locations based on ramp usage frequency and climate conditions (outlined by your transit agency). Lubrication procedures should be performed by transit agency maintenance personnel.

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Braun Commercial RA300 Transit Ramp

Braun "Worry-Free" Limited Warranty

The Braun Corporation ("Braun") warrants it's ramp against defects in material and workmanship for three years, provided the ramp is installed, operated and maintained in conformity with this manual. Warrantied replacement parts are covered until the expiration of the Braun warranty or 90 days, whichever is longer. The Braun warranty covers the cost of labor for any repair or replacement covered under the warranty during the first year of the warranty period, if an approved Braun dealer completes the warranty work.

The warranty registration card accompanying this ramp is to be completed and returned to The Braun Corporation within 20 days of purchase. If Braun receives the warranty card, the warranty period begins on the day the ramp is put into service. If Braun does not receive the warranty card, the parts warranty will expire in three years, and the labor warranty will expire in one year from the manufacture date of the ramp.

The Braun warranty does not cover any defects in the motor vehicle on which the ramp is installed, or defects in the ramp caused by any defect in the motor vehicle. The warranty does not cover work deemed by Braun to be normal maintenance, service, or periodic adjustments necessitated by use or wear. The Braun warranty is null and void if any repair or maintenance work is completed during the warranty period using parts not authorized by Braun or if, as determined solely by Braun, the ramp is damaged through accident, misuse or abuse, or altered in any way.

THIS WARRANTY IS IN LIEU OF ALL IMPLIED WARRANTIES, INCLUDING WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, PERFORMANCE, OR OTHERWISE, WHICH ARE HEREBY EXCLUDED. IN NO EVENT SHALL BRAUN BE LIABLE FOR ANY DAMAGES, WHETHER DIRECT, IMMEDIATE, INCIDENTAL, FORESEEABLE, CONSEQUENTIAL, OR SPECIAL, ARISING OUT OF OR IN CONNECTION WITH ITS PRODUCT.

To contact Braun or to obtain a list of Braun authorized dealers, call 1-800-THE-LIFT or visit our web site at www.braunlift.com.

The Braun Corporation
Winamac, Indiana

Return Authorization Procedure

When processing any warranty claims (parts, repairs, etc.), all requests must be processed through The Braun Corporation Product Support Department. Call 1-800-THE LIFT during normal working hours. Product Support will issue a Return Material Authorization (RMA) number and detail the procedures required for processing returns and/or authorizing credit.

The ramp identification information is provided on the Braun Serial No./Series No. identification tag and the two warranty cards (supplied with ramp). The lift identification information must be provided when filing a warranty claim or ordering parts.

33778 March 2007

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All illustrations, descriptions and specifications in this manual are based on the latest product information available at the time of publication. The Braun Corporation reserves the right to make changes at any time without notice.

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